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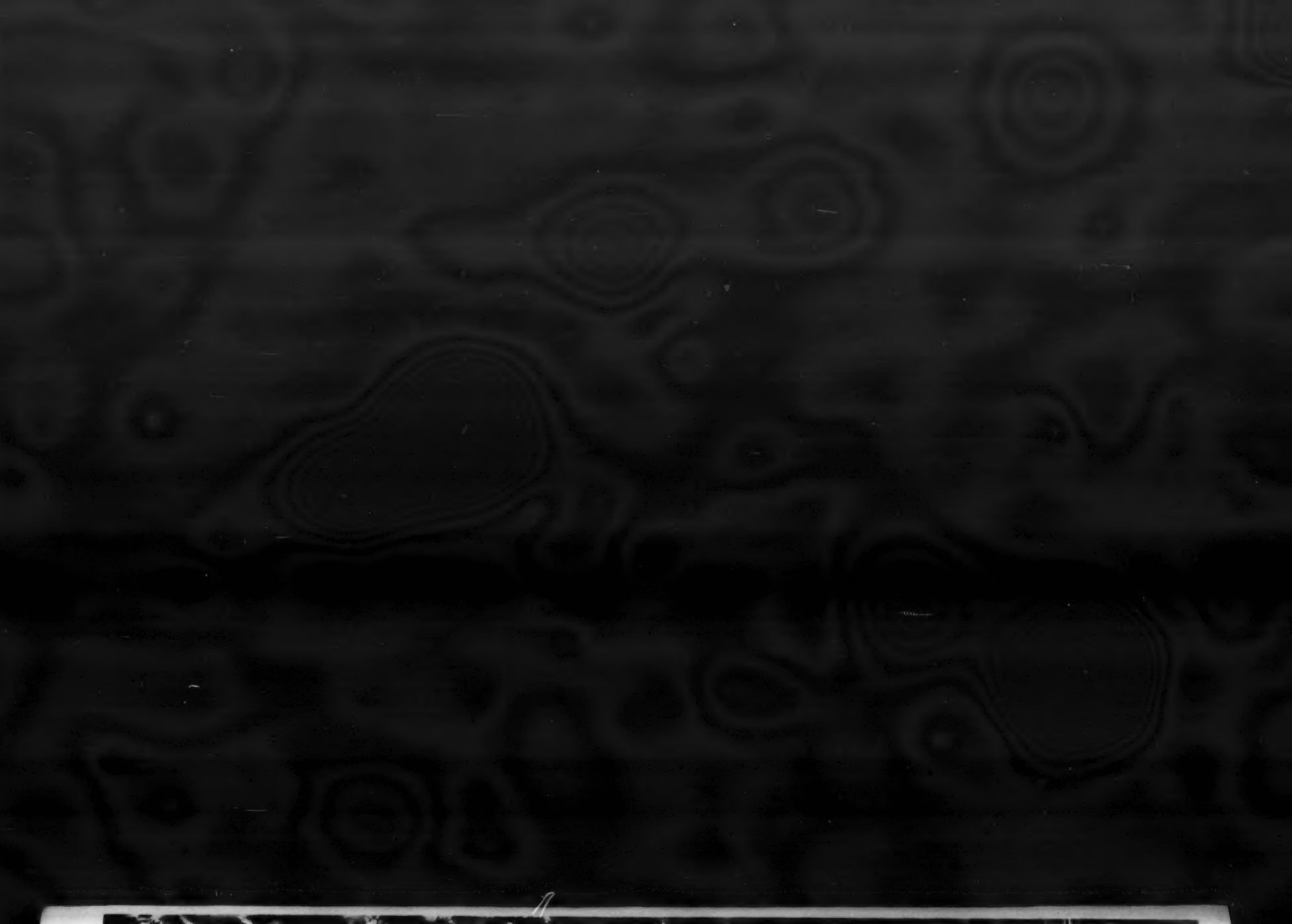

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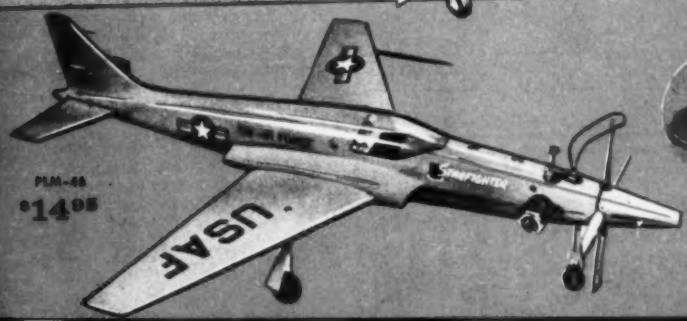

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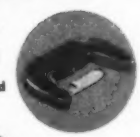

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P. G. F. CHINN

Foreign Notes

► This year's World Championship meet, held at Cranfield, England (full report elsewhere in this issue) provided plenty of items of technical interest—far too many, in fact, to be reported in full here—but we propose to devote this month's FN to some notes on a few of the more interesting things we saw among the foreign (i.e. non-American) entries.

With the weight rule up 50 percent in the FAI power class (26 oz. for a .15 cu. in. motor), everyone is now very conscious of the need for a really powerful engine. This was reflected at Cranfield in the wide use of the Oliver Tiger Mk.III Diesel. Nearly 40 percent of the contestants were using this hand-built British motor, including entries from America, Australia, Austria, Canada, Denmark, Eire, Finland, France, Norway, Sweden and, of course, Great Britain.

Second in popularity was the West German Webra Mach-1 (23 percent of the entry) and Japanese Enya 15-D (10 percent). Glow-plug engines, which won three out of the four previous World Championships (K&B's in '53 and '54 and O.S. Max in '56) were, this year, very much in a minority, although Arthur Collinson, who topped the British team eliminators, was using K&B 15's, as was America's Larry Conover.

Obviously, one of the reasons for the switch to Diesels is that most of the contestants had expected to find bigger diameter props necessary to cope with the added weight. The extra torque of the Diesel at speeds well below the usual 14-15,000 rpm speeds of the hotter glow 15's, would be expected to pay off here. In fact, however, quite a few entrants were employing, in the actual contest, props of down to 8/4 size—no bigger than they would have used under the old rules.

One thing that was evident among some of the Oliver powered entries—especially certain of the Continental European jobs—was the inability of their owners to get miss-free high rpm from their engines. This was possibly due to their lack of sufficient experience with fuels for the Oliver Tiger, an engine which demands a heavy proportion of amyl-nitrate in the fuel to avoid this characteristic misfire at speeds above 12,000 rpm.

Despite the numerical superiority of the Olivers, it was, however, a relatively modest engine, an East German Schlosser 2.5, that provided the power for Frigyes' winning model. The Schlosser, it will be remembered, was featured in our "Red Engines" article in the October '58 MAN and earned favorable comment for its excellent construction and finish. The power delivered on test proved to be about 20 percent less than that of the Oliver—much as one would expect, in fact, of an engine of its general design. Although Frigyes' engine may have been of above-average performance, it was certainly his consistent flying that was the winning factor. His model provided ample support for the contention that there is a wide divergence of ideas about what constitutes the best set-up under the new rules. It was, for example, well under the maximum area allowed, yet was nearly 20 percent above

(*Continued on page* 42)

30th Year of Publication

M.A.N.

MODEL AIRPLANE NEWS

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ARTICLES

FEATURES

WILLIAM WINTER, Editor

WITTICH HOLLOWAY, Art Director

Contributing Editors: Peter Chinn (England), Don Grout, Ed Lorenz, Ted Martin, Bruce Wennerstrom, Harry Williamson

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by William Winter

► The Hungarian team should be congratulated for its brilliant near-sweep of all four international trophies at the World Championships, held at Cranfield, England, as reported by Pete Chinn, on pages 12 through 15. Even more so should be Bond Baker, all the way from Australia, who—like his countryman, Allan King who did it in 1954—won the greatest of all trophies and contests, the 30-year-old Wakefield event. Had our own Carl Wheeley got off a fifth maximum in power, with Dean's model (the Massachusett's Dean), we might have taken the gas event. But we didn't. The US has been blanked for five years running.

Can we do better? Are we just unlucky? Are we inferior? The inevitable questions are being asked. One question, do we take things seriously enough, can be answered here. We do not. Most American modelers regard their fellow modelers who go to the eliminations as a bunch of opportunists interested in traveling abroad for "nothing." The dozens of mysterious "internationalists" are pictured by the indifferent tens of thousands of contest goers, as a kind of monopoly who run the eliminations for their own edification. This kind of stupidity would have gotten our ancestors scalped before the first Thanksgiving finals.

Why doesn't the industry support the teams financially—and surely it is no credit that the Oliver Tiger is darn near a must if we are to beat the Europeans? Why should we care that a special motor would cost more at the hobby shop and would not sell against cheaper competition? Why don't we fly more FAI events at the Nationals—at all contests? Why do we fly anything else?

• • •

What are we up against? How do other countries make ready for the World Championships? Thanks to Laszlo Berke, who was a "master of sport" in Hungary until he decided in 1956 to make the United States his country for life, we can tell you how the Hungarians, and the Czechs in 1956, prepared, and why they won. Berke, incidentally, held the world speed record that was just broken by Bob Lauderdale at the 1957 Nationals.

The Hungarians are professional modelers; this not meant to be derogatory—it is simply a fact. And so are all the other east European model building teams. Head of the Hungarian Model Research Institute, is G. Benedek, world famous for airfoil developments for many years. Some members of the Hungarian (*Continued on page 7*)

NEXT MONTH'S COVER Boy and models

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PLANE ON THE COVER

Chance Vought's Crusader F8U-3, which artist Jo Kotula depicts whistling over the Forrestal, is an all-weather Mach 2 fighter. Ventral fins for high-altitude stability appear below the stabilizer. The missiles are Sparrow III, air-to-air type. The lower fins swivel up to clear runway or deck. The air scoop now angles forward.

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MAN at Work

(*Continued from page 4*)

team are employed by the Institute. Other members are given paid "sport vacations" any time they need one. All team members are kept together for at last a month prior to contests, and do nothing but fly planes from sunrise to sunset, rain, drizzle, wind, or calm. They can fly in anything. They cannot be taken by surprise. Nor can they blame the Scandanavian or British weather as the rest of us can.

Modeling is not just a hobby, not just fun, but a struggle, and perpetual hard work to stay in the magic circle of people qualified as "masters of sport", now a familiar term from anywhere behind the Iron Curtain. This means less working hours, paid sport vacations, respect, fame, not being pushed around by the secret police for every minor thing and above all: THE PASSPORT. All these things are only dreams to the average citizen.

Berke feels that more, and constant, U.S. attempts at FAI records would be the first step to interest our modelers in world modeling affairs. We do not pay enough attention to FAI activities claims Berke who, as so many other friends tell us these days, explains that the rest of the world doesn't know anything about AMA rules. The world judges modeling success by FAI standards. Our successes under AMA rules compared with the Hungarian achievements, are considered as the Vanguard to the Sputnik.

The Hungarian or Czech modeler can make an attempt at a world record any time, any place he wants to. In America, it is like organizing a circus and, for the most part, FAI record trials are merely publicity stunts put on by AMA at the Nationals. This is a disgrace. And there is plenty we can do about it!

In Hungary, every club must have a few qualified FAI official time keepers. If someone means to try for a record, he merely notifies the central club. He picks up a couple of time keepers, goes out to the flying site, and that is all there is to it. He has plenty of witnesses because members of various clubs come out to kibitz—which sounds familiar.

The American who is given the honor of trying a Nationals publicity stunt, must wait until next year, if he misses. Maybe he'll never be asked again. Berke says he wouldn't carve a prop for such a slim chance. The Hungarian selects a good day. And the best part of the day. If he misses, he can try the following week.

"Imagine the FAI record shower," urges Berke, "if any local club could set out any evening for the super market parking lot (this boy catches on fast!), or airfield. If enough publicity was given the successful guys, perhaps even an FAI record class could be built up. There are numberless planes which are capable of breaking FAI records.

"An FAI chapter should be organized within the AMA. This chapter would keep up with FAI affairs, would stress FAI categories, and, especially, help all record trials."

• • •

► To MAN at Work, it seems that the lone-wolf Australians who twice took the Wakefield within five years, despite Hungarian and Czech, and maybe Russian and Chinese drill-teaming, and despite noisy eliminations of the British and the Americans, deserve great respect. At least individual effort is not in its twilight. Dare say that King in '54 and Baker in '58, worked as hard as the Hungarians—but had fun. Each of these guys placed in gas and one wonders if some sun-burned Aussie won't

(*Continued on page 30*)

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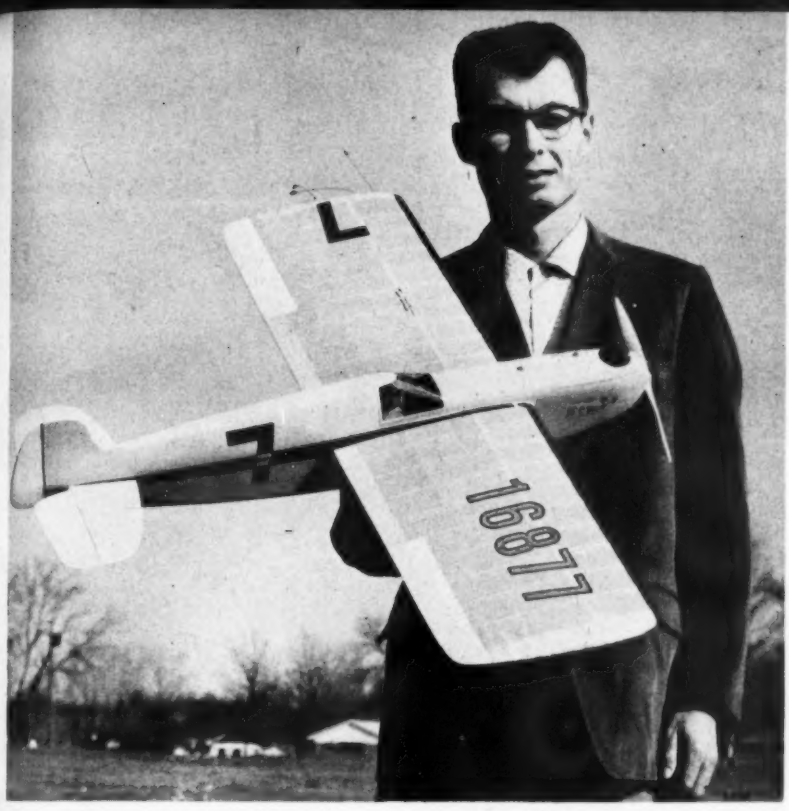
25¢ New, Giant 64 page "Silver Jubilee" Catalog. The most complete model reference source in the world. Thousands of Pictures! Over 10,000 Items! 2 Colors! It has everything . . . every engine, every model . . . planes, boats, cars, rubber models display and plastic . . . tools, accessories, parts . . . just everything!

10¢ Fine jumbo catalog of thousands of hobby items: Planes, boats, cars, engines, accessories, solids, gas, rubber.

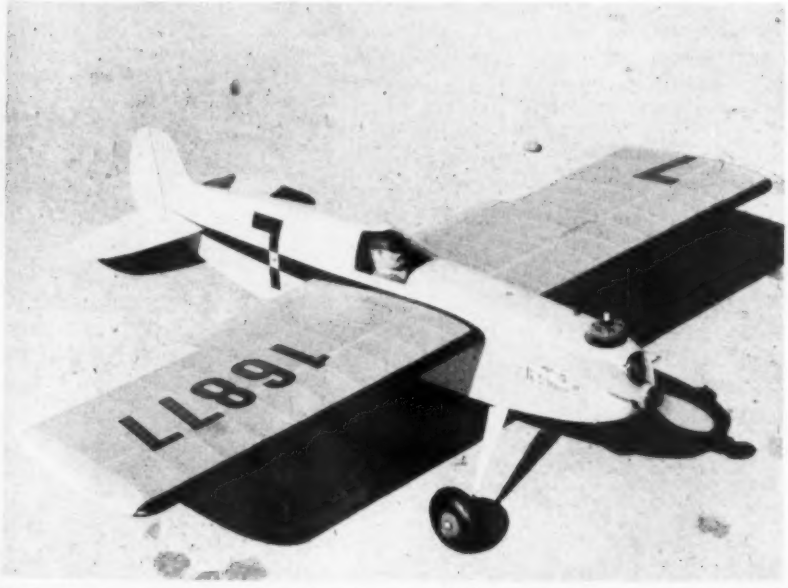
25¢ 64 page 2-color RAIL ROAD catalog. HO & TT gauge . . . over 5000 items, fully illustrated— loads of data, etc.



If you cashed in on that wonderful Sure Fun on floats, by the same designer, you've got good times ahead with Snap. Use that old bellcrank, etc., if you must—but variable throttle, wow!

SNAP!

Flying this model is like driving a Caddy. For .19's to .23's, it's the last word in sport jobs. Insides, outsides, eights, too—if you have to.



For Goodyear racer fans, the addition of apple-cheek cowl to Clements' unique ukie will turn your ship into a true dream crate. For all-out stunt work, add a rib or two, as copy describes.

by VERN CLEMENTS

► Snap is a very snappy performer, as well as a snap to build. It combines plenty of flying fun with good appearance from a simple functional design.

The original Snap uses the J. Roberts Flight Control system which multiplies the fun element many times, giving the flier complete and instant control over the engine rpm's while on the ground and in the air. This means of control inspires a realistic type model, to coincide with the extremely real-like performance allowed by the Flight Control technique. However, you can install any control system you wish.

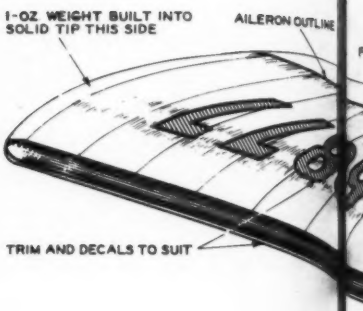
Snap does not have fancy curves, but its configuration very closely resembles a full scale Goodyear Racer. The scalelike appearance would be greatly enhanced with the addition of wheel pants and a horizontally mounted motor with an apple-cheek style cowl.

Improved ground handling qualities were incorporated into this design by using a 50% tail moment arm and large wheels, as well as utilizing the front lead-out cable for "up" control. The use of the front cable for "up" elevator positions the line pull closer to the wheels, resulting in less crabbing away from the center of the circle during taxi runs with "up" control. This situation should be reversed on a tri-cycle gear design, using the rear lead-out cable for "up" elevator. Crabbing action is of little concern on models that take-off fast using full power, but looks bad when taxiing with low throttle speed. With the Flight Control system you will enjoy taxiing and shooting landings, which is why the above mentioned good ground handling qualities were designed into the Snap.

Three airfoils are shown on the plans, giving you a choice. My version utilizes the NACA 0010 section, resulting in a very fast performer with the fine little K & B .23 doing the work. Consecutive vertical and horizontal eights, and inside or outside loops can be performed with my Snap at a breakneck speed, or at reduced throttle with the plane retaining consistent pull on the lines. This plane has a good power reserve when using engines in the .19 to .23 cubic inch displacement class.

Flying wires used on this model are three .010 x 57½ ft. flexible steel cables available from the Flight Control manufacturer, already tied in even lengths.

My Snap weighs 26½ ounces, with its effective wing area of 295 square inches putting it in a hot precision-sport class with smooth flying qualities. It is maneuverable as is, but if you are after a sharper turning full-stunt pattern performer, try adding another rib spacing of span to each tip, and possibly one *(Continued on next page)*



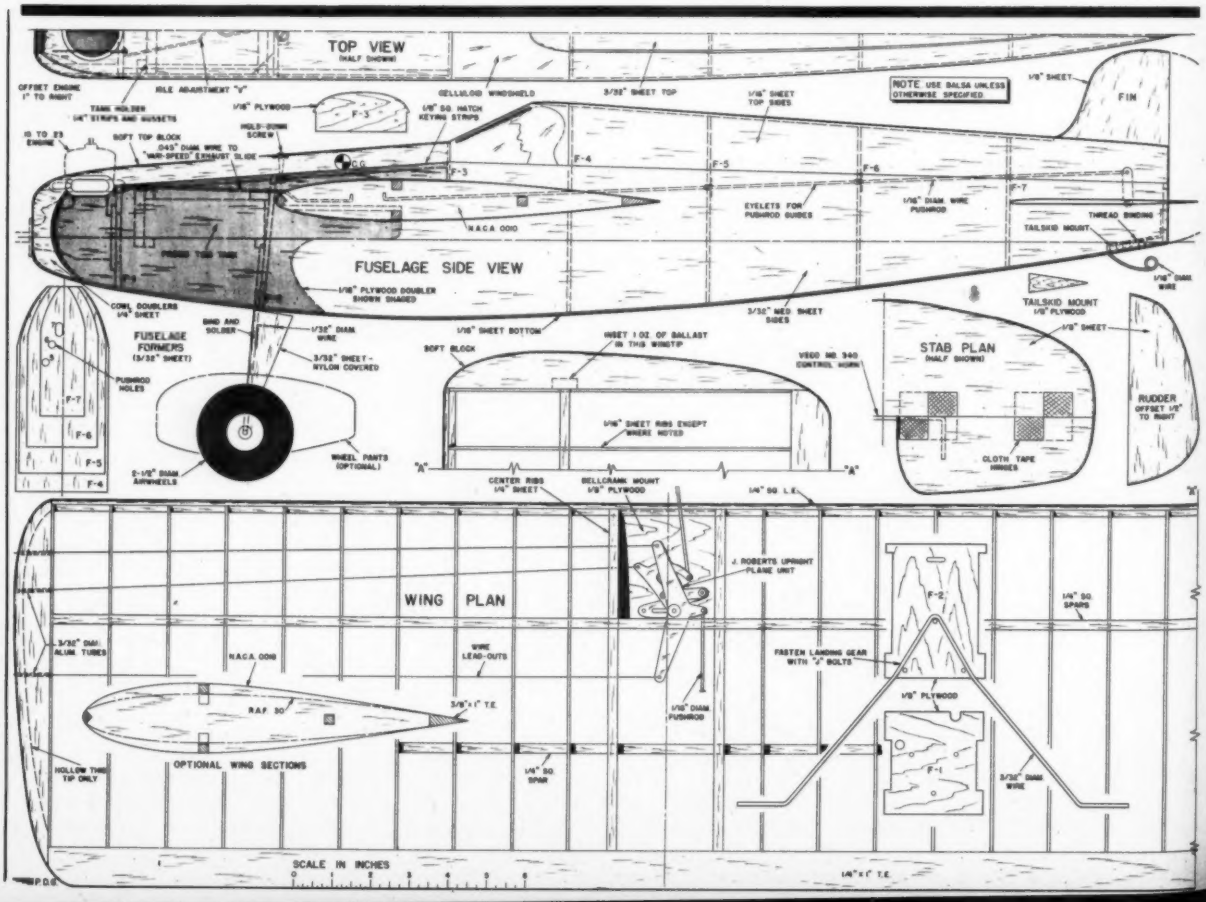
Thin-winged version flown by the author really scoots. Three sections given to suit your choice.

inch more chord. The total flying weight should also be kept low. These modifications would reduce the wing loading and give even more maneuverability. You will find that the throttle control feature can be used to great advantage for stunt pattern flying, too. The basic sport design of this plane, as presented, could be easily modified to the above stunt layout, as well as combat, rat racing, or even team race events by carving a deeper cowl which would enclose the engine. These events would naturally require the use of the fast NACA 0010 airfoil and possibly a .29 engine for competition. If you power your version with an engine over .23 cubic inches in displacement, basswood or pine should be substituted for the balsa wing spars.

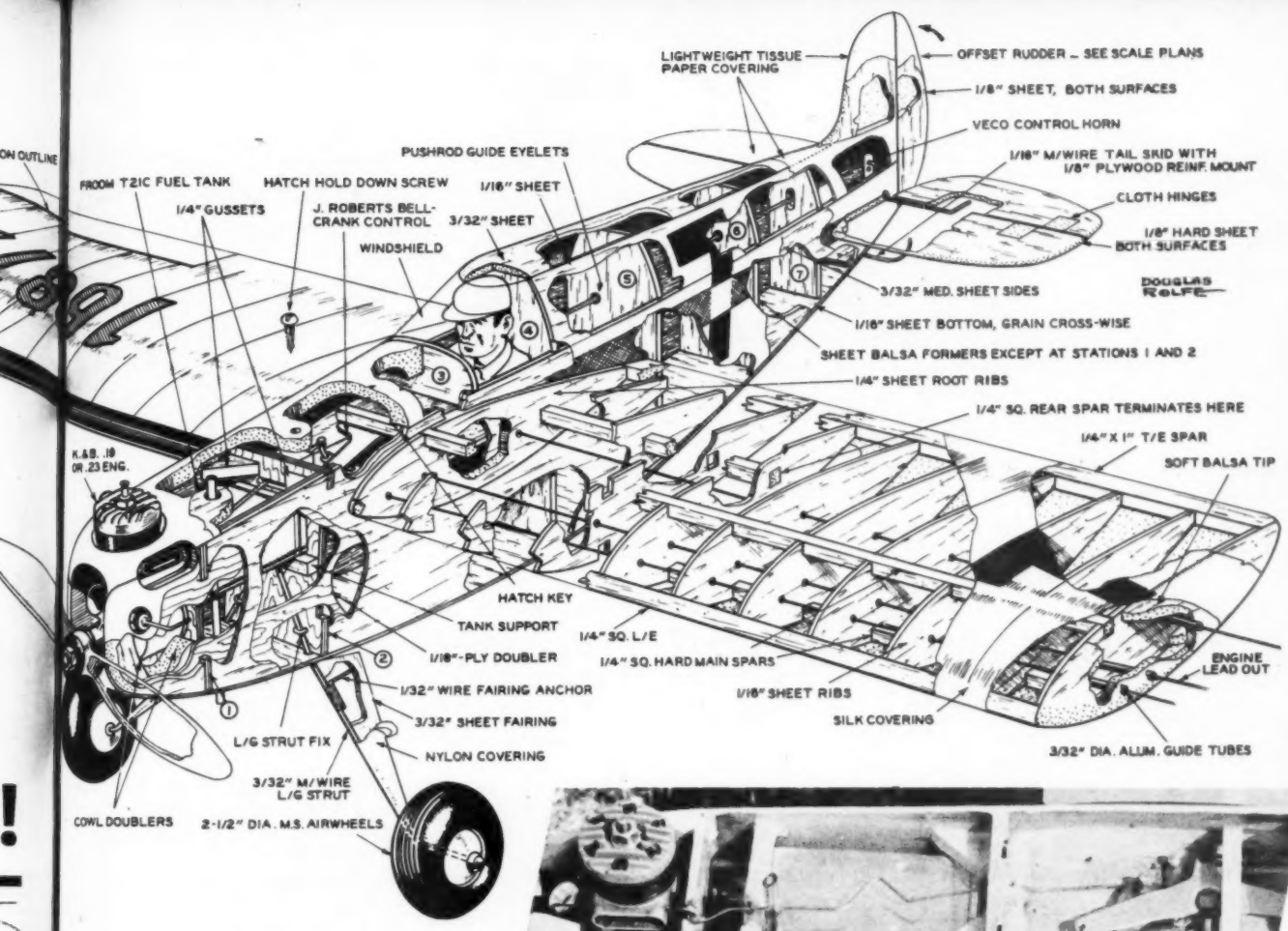
The removable hatch allows easy access to all mechanical components. You will also appreciate the simple control installation, since the Plane Unit is in alignment with the exhaust Vari-Speed control.

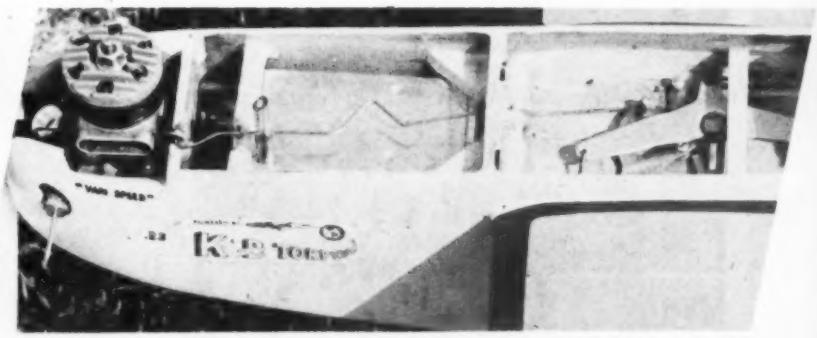
Construction: Choose two 3/32" x 4" medium balsa sheets of equal weight and strength for the fuselage sides. Using carbon paper for all tracing from the plans to wood, trace the fuselage side onto one of the selected side sheets. Lay the other side sheet on the bottom of the first sheet and push three

SNAP!



FULL SIZE PLANS AVAILABLE. SEE PAGE 60





Slide throttle is precision fit. Vee in linkage permits adjustment. RC people should look into it.

Below—A thick winged ship, rear, and author's job, foreground were flown together in novel tests.

or four pins through these two sheets from the bottom side. Using this method you can cut and sand both sheets at the same time to proper outline. Lay the finished sides on the plans to check accuracy, making sure your chosen airfoil cut-out and the stabilizer are at zero angle. Also check the accuracy of the notches you have cut out for bulkheads No. 1 and No. 2. Trace and accurately saw the 1/16" plywood nose doublers to shape. Pre-cement these doublers and their place of contact on the fuselage sides, letting the cement dry before applying more for permanent joining. While the doublers are drying on the sides, trace and cut the fuselage formers to shape. Formers No. 1 and No. 2 are ⅛" plywood. Former No. 3 is 1/16" plywood and Nos. 4 through No. 7 are 3/32" sheet balsa.

The fuselage is assembled by first cementing formers No. 1 and No. 2 in place. Check the symmetry of side curvature while cementing the remaining formers in place, working from the nose to the tail. At this point the tail end of the fuselage sides can be cemented together, using clamps to hold until the cement dries. Check alignment again by sighting down the fuselage sides. The 3/32" (*Continued on page* 34)

Best individual performer, Bond Baker, Australia, with first Wakefield, third gas. Aussie Allan King, took Wakefield in 1954.

Minus mustache, beard and bush hat, Baker clasps the 30 year old Wakefield Trophy. American team had highest average age of meet.

The 1958 World Championships

Victorious Hungarians hoist Frigyes after double win. Other nations had better models, but consistency, long training, paid off.

Frigyes about to launch model on winning flight. A twenty-year modeler, he works for the model section of Hungarian Aero Club.

With three out of four International Trophies, Hungary made strong bid for a clean sweep but Australia's Bond Baker got a deserved win in Wakefield.

by PETER G. F. CHINN

► To Americans, including those who remember the "great" day of the Wakefield Cup contest before the war, when the U.S. and Britain showed the rest of the world how to fly model planes, the overall results of the 1958 World Championships may seem pretty dismal reading.

The fact is that things have changed—even since Cranfield, 1953, where, at the last combined Wakefield and Power World Championships held in England, all four championships went to the U.S.A. Since the war we have seen many European nations coming to the fore in international events; notably Germany, Italy and Scandinavian countries and, today, there is even stronger opposition from the East European republics, especially Czechoslovakia and Hungary.

These latter take their model flying really seriously. Their teams are selected following rigorous eliminating trials in which candidates may be required to make as many as forty qualifying flights. They practice assiduously and the manager-team relationship of some of their teams is in marked contrast to our own. The Hungarian manager was not at Cranfield merely to act as interpreter or chief fuse-lighter: his word was law to his team and he was there to see them win—even if it meant arguing with the timekeepers as to whether Benedek's last flight was 99.8 seconds or 100. . .

Highest placed American (15th) in Wakefield, was Herb Kothe. Jim Patterson assists winding.

In background, just behind photographer, Benedek of Hungary about to launch his model.

Wheeley, proxy-flying for Dean, clocked 1:53 on last flight after four maxes. ROG's are gone.

Compared with last year's World Championships at Prague, however, the overall showing of the Western teams—even taking into account the absence of the Russians—was appreciably better and there is no doubt that the meet was on the whole, a highly successful one.

Profiting by their experience in running two other World Championships at Cranfield during the last five years, Britain's S.M.A.E. made an excellent job of the organization and it would be hard to imagine a better site, for an event of this type, than the College of Aeronautics at Cranfield, with its excellent facilities, comfortable accommodations and fine airfield.

The 1958 Championships began on Friday, August 1, with the checking in of the various teams at S.M.A.E. Headquarters, Londonderry House, Park Lane, London, from where they were taken to Cranfield by busses and their model boxes, separately, by truck. About a third of the visitors had attended previous Cranfield meets and the list of names read like a modelers' Who's Who.

The next day, Saturday, was given over to processing and test flying. Processing began at 9:00 a.m. and finished on time at 6:00 p.m. Nineteen models were found to be outside the specification—mostly under weight—but all were put right in time to qualify. Heavy rain in the afternoon curtailed test flying, but contestants were out again in force during the evening.

Highest placed contestant from American continent was Hugh Tuck, of Canada. He took 10th in gas with Oliver power—best engine.

Strangest power model, high-thrust, low-wing, Hans Beck, Germany. Webra Mach-1. Stable flier.

Strangest Wakefield, by Marc Cheurlot, France.

1958 World Championships—continued

Famed Benedek was Wakefield favorite at end of fourth round, but clocked only 1:40 on final flight. No American wins since 1953.

WAKEFIELD CUP—INDIVIDUAL RESULTS

1. Baker, R., Australia	162	158	180	180	180	860
2. Zurad, S., Poland	180	116	180	180	168	824
3. Johansson, R., Sweden	133	146	180	180	180	819
4. Scardicchio, V., Italy	141	180	180	180	136	817
5. Benedek, G., Hungary	180	180	180	173	100	813
6. Kennedy, D., New Zealand (Proxy: E. Barnacle)	180	180	105	180	164	809
7. Fea, G., Italy	161	180	140	132	180	793
8. Lefever, G., Great Britain	180	98	180	180	126	764
9. Azor, L., Hungary	180	131	180	98	174	763
10. Gordon, A., Ireland	159	160	172	98	168	757

ALPHONSE PENAUD CUP—TEAM RESULTS

1. Hungary	2304
2. Italy	2259
3. Great Britain	2179

VICTOR TATIN CUP—INDIVIDUAL RESULTS

1. Frigyes, E., Hungary	180	180	170	180	180	890
2. Hajek, V., Czechoslovakia	180	164	180	180	180	884
3. Baker, R. S. B., Australia	174	150	180	180	180	864
4. Stabler, R., Germany	133	180	180	180	180	853
5. Ordogh, L., Hungary	126	180	180	180	180	846
6. Bily, J., Czechoslovakia	180	145	157	180	180	842
7. Hormann, G., Austria	147	157	177	180	180	841
8. Glynn, K., Great Britain	125	180	172	180	180	837
9. Simonetta, A., Italy	180	117	180	180	180	837
10. Tuck, H., Canada	180	162	154	180	160	836

FRANJO KLUZ TROPHY—TEAM RESULTS

1. Hungary	2556
2. Czechoslovakia	2500
3. Great Britain	2434

Meanwhile, news had come through of the Russian and Czech teams, neither of which had shown up at the reception the previous day. The Czech's air transport had been delayed and they eventually arrived, via Zurich, in the early hours of Sunday morning, having just enough time to get an hour's sleep, their models processed and a few quick check flights before the contest began. The Russians, however, sent word that they had decided not to attend, due to the illness of three of their team members. This cancellation repeated the pattern of the previous Championships held in England, when the Russian team was withdrawn at the last moment, and was a disappointment to everyone.

Sunday morning dawned bright and promising and we were awakened soon after 6 a.m. by the distant buzz of high revving engines as contestants put in some before-breakfast practice. Half an hour later we were out on the field, picking up a couple of contestants on the way, to find several groups active.

The Hungarians were immediately noticeable as having their models well and truly in the groove. Their smartly finished ships were all of similar design, featuring a slim fuselage, pylon wing mount of moderate height and mostly powered by Webra Mach-1 diesels. From the U.S., Larry Conover, complete with hired bicycle, was there with the veteran "Lucky Lindy" (third in '56), one of the very few glow-engined entries. So was Carl Perkins with a beautiful looking high-thrustline Oliver-powered model with elliptical surfaces and an undoubted high performance, but which, unfortunately, was proving troublesome.

Back to quarters (with appetites ready to deal with a liberal breakfast and plenty of coffee) everyone was keeping his fingers crossed for continuing good weather but, by the time we returned to the field—this time accompanied by those two globe-trotting Australians, Alan King and Bond Baker—the wind had freshened appreciably.

The contest was divided into five rounds of 90 minutes each, two in the morning and three in the afternoon, but the flying order of competitors was in no way restricted and they could make their flights at any time they wished during each round. Four timer control points were in operation, under the direction of a chief timekeeper. Most of the timers were well-known British modelers and everything worked very smoothly.

In the first round, 28 maximums were recorded, includ-

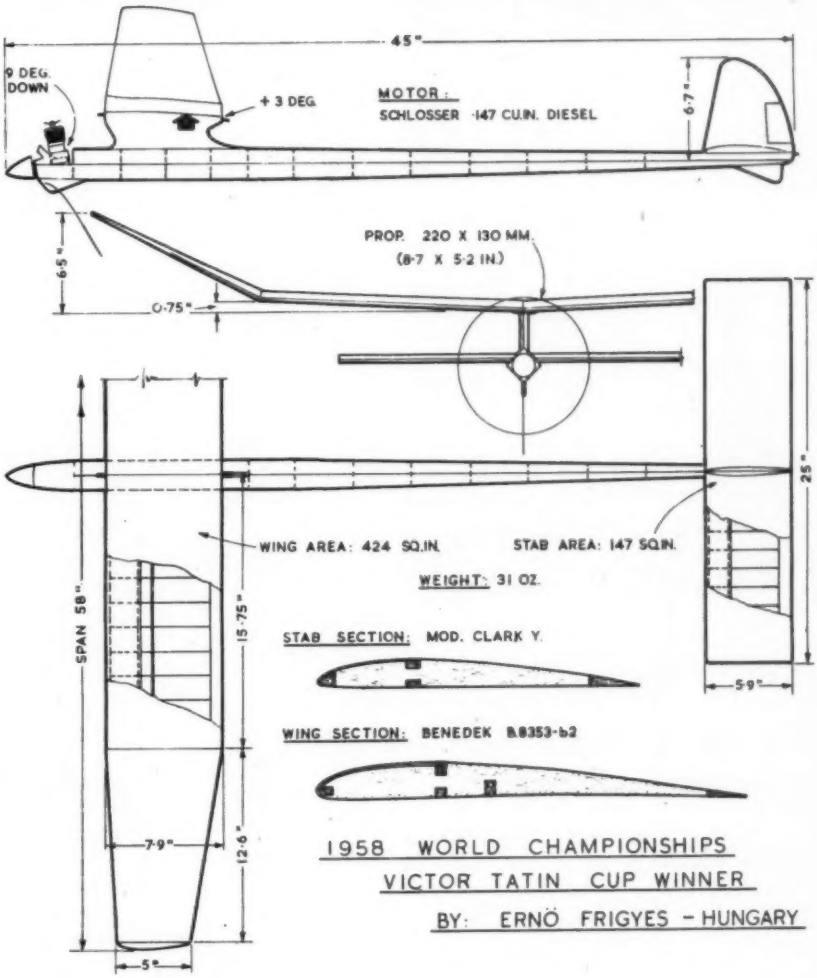
Recovery service in operation. Models drifted fast. Cyclists rushed

ing a perfect score for the Czech team despite their late arrival. Great Britain and Italy had three each, followed by Germany, Hungary, Ireland, Poland and Sweden, all with two.

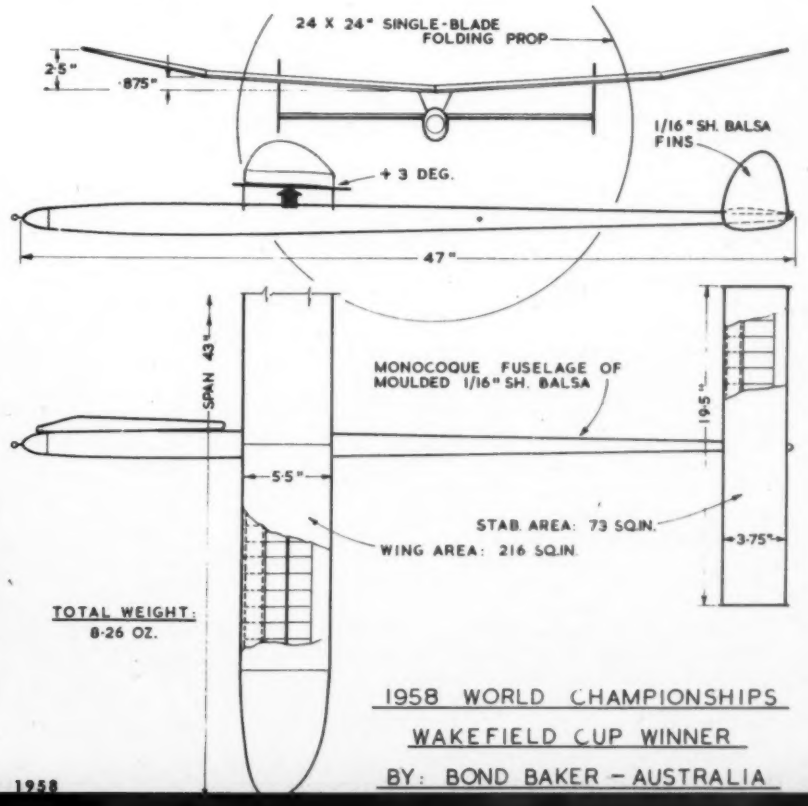
The models, built, of course, to the new 1958 FAI rules calling for a 50 percent heavier loading, were, in some cases, getting almost as much height as we had seen under the old rules. The rule allowing hand launching contributes a little here, but the new loading requirement does not seem to have done much towards taming the power flight. There were a few spiral dives during the day and one thing that did emerge was the surprising resistance to crash damage demonstrated by some of these heavier ships.

In the second round, the Czechs dropped sharply, with no maxes scored, whereas the U.S., making a strong recovery after a discouraging first round, had three maxes, as did Great Britain. Two each were scored by Germany, Hungary, Italy and Yugoslavia and at the lunch interval the team positions were: Great Britain 1025 points, Italy 1017, Ireland 1000, Czechoslovakia 980, Hungary 964. In the individual placings at this stage, eleven contestants had double maximums. They included Bill Dean of the U.S.A. (whose model was being proxy flown by Carl Wheeley), Arthur Collinson and Vic Jays of Britain, Pecorari and Castegnaro of Italy, Frigyes of Hungary, Niemi of Finland, Piesk of Germany, Vujig of Yugoslavia, Fontaine of France and Woods of Ireland.

The third round saw a drastic whittling down in the number of perfect scores and only Dean, Pecorari and Niemi emerged unscathed. Javs dropped seven seconds to be relegated to fourth place and his team-mate Collinson (like Con- (*Continued on page* 45)



1958 WORLD CHAMPIONSHIPS
VICTOR TATIN CUP WINNER
BY: ERNÖ FRIGYES – HUNGARY



1958 WORLD CHAMPIONSHIPS
WAKEFIELD CUP WINNER
BY: BOND BAKER – AUSTRALIA

contestants to landing areas. Cars also used.

Early Birds

by DOUGLAS ROLFE

1910 AVROPLANE

Number 3

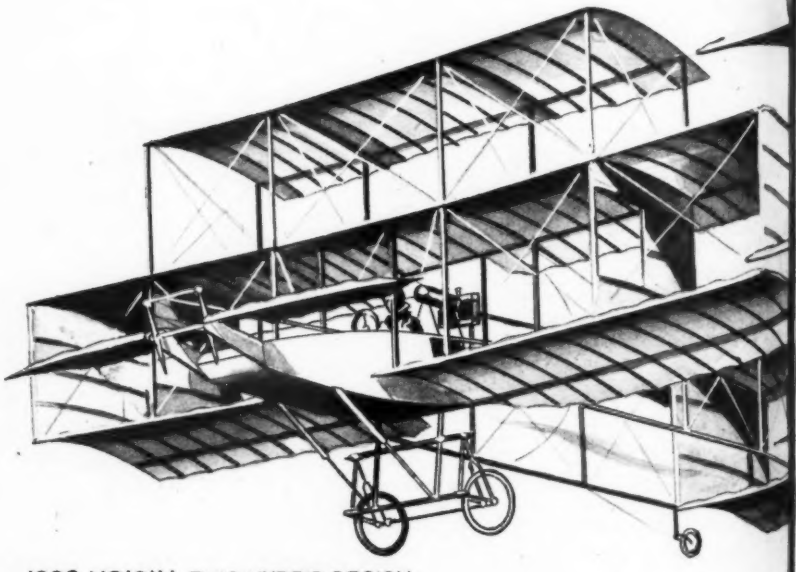
THE FIRST TRIPLANES

The preceding two installments of this series having dealt with the first monoplanes and biplanes. Here is a selected clutch of the first triplanes. Just who introduced the type is, like many subjects concerning historical aviation, a controversial matter. One thing is certain, the day of the triplane, as a practical airplane, came to a grinding halt soon after World War 1.

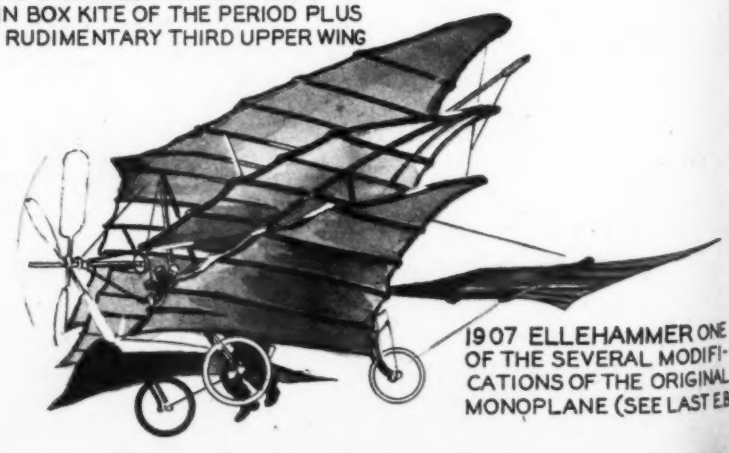
Oddly enough, the little Avro "Bullseye" illustrated here, recently has been the focal point of a bitter controversy in one of the leading British aviation journals. Did it actually fly or only make short hops? Well, the first flights made by the Wright Bros. were mere hops but are generally recognized today as the first true powered flights so why all the fuss!

Looking at this very early Avro (first design was a biplane which did not fly) it seems incredible that it is a direct ancestor of the delta-wing, jet-powered, Avro Vulcan which is one of the fastest and most formidable long range bombers in service today!

Of the other types shown, the Ellehammer was one of many types evolved by this pioneer designer before reverting to purely monoplane design. The odd-looking Goupy probably shares with A. V. Roe's "Bullseye" honors for being first in this field (the Ellehammer design being too crude for serious consideration) and it is at any rate a sturdier and more sophisticated design than the "Bullseye."

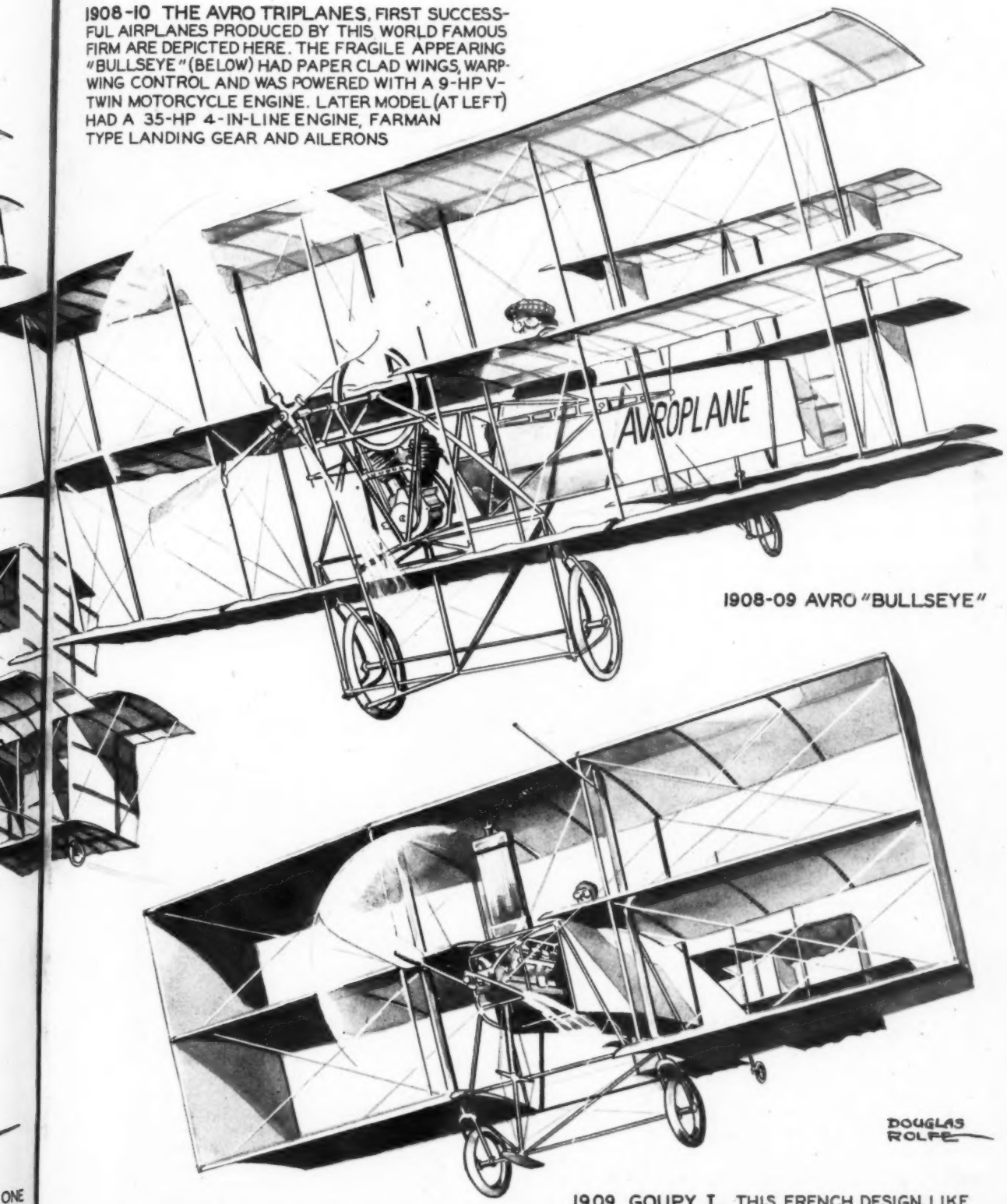


1908 VOISIN THIS HYBRID DESIGN WAS BASICALLY THE STANDARD VOISIN BOX KITE OF THE PERIOD PLUS A RUDIMENTARY THIRD UPPER WING



1907 ELLEHAMMER ONE OF THE SEVERAL MODIFICATIONS OF THE ORIGINAL MONOPLANE (SEE LAST EB)

1908-10 THE AVRO TRIPLANES, FIRST SUCCESSFUL AIRPLANES PRODUCED BY THIS WORLD FAMOUS FIRM ARE DEPICTED HERE. THE FRAGILE APPEARING "BULLSEYE" (BELOW) HAD PAPER CLAD WINGS, WARP-WING CONTROL AND WAS POWERED WITH A 9-HP V-TWIN MOTORCYCLE ENGINE. LATER MODEL (AT LEFT) HAD A 35-HP 4-IN-LINE ENGINE, FARMAN TYPE LANDING GEAR AND AILERONS



1908-09 AVRO "BULLSEYE"

DOUGLAS ROLFE

1909 GOUPY I. THIS FRENCH DESIGN, LIKE THE BRITISH AVROS PORTRAYED ABOVE, WAS ONE OF THE FEW BONAFIDE TRIPLANES PRODUCED DURING THE EARLY DAYS OF FREE FLIGHT

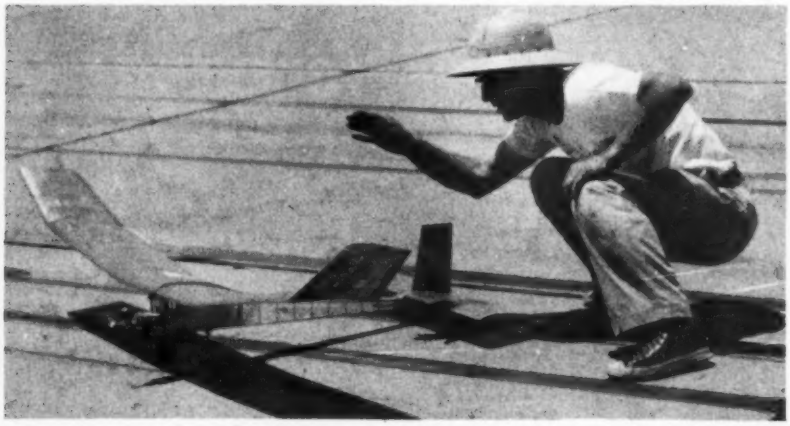
At Minneapolis in 1956, Pelican left boards but got off grass anyway. At King Orange Meet, in Florida, Pelican set national record. The Cargo jobs now fly 1,200 ozs. plus, per cu. in. disp.

Knock-off gear, rubber-wrapped joints, electrical tape over all. Plane uses an auto-rudder.

Pelican

1958 NATIONALS WINNER

Whoever said the bumble bee could not fly should take a look at this wondrous bird. Add 12 more in. span and . . .



At Dallas, 1956, Pelican gets off with 45 ounces for 39.9 seconds. This year, areas to 1,200 sqs.

by LAWRENCE H. CONOVER

CARGO DATA SHEET

YR.	NAME	RPM	CARGO	AREA	MODEL WEIGHT	WING LOADING
51	Randolph	12,500	14.0	300	8.5	7.5
52	Schoenky	12,800	14.0	375	6.3	5.4
52	Latham	13,000	17.5	400	9.0	6.6
53	Rath	13,500	23.5	500	6.0	5.9
54	Lang	14,500	32.0	500	9.0	8.2
55	Wright	16,400	41.8	560	12.0	9.6
55	Lang	16,600	44.0	600	11.0	9.2
56	Blanchard	16,500	42.0	500	12.0	10.8
57	Conover	18,000	43.1	650	19.0	9.0
58	Yardley	16,500	38.0	1200	20.0	4.8
58	Conover	19,000	48.0	700	19.0	9.6
58	Gurnett	18,600	54.0	1050	20.0	6.8

PROPS USED BEFORE 1956, 6-3 TORNADO. AFTER, 6-3 TOP FLITE NYLON OR BLUE PLASTIC. COX RACING FUEL.

► "A PAA Load model," to quote the 1954 PAA Rule Book, "is more than merely a model that flies. It is in all essentials, a working miniature of a full scale man carrying airplane. No other type model follows so closely the requirement, the problem, and the realistic solution of full scale mechanical flight."

Simplicity, durability, and attention to detail, is the formula for Cargo. To begin, you must "design around the payload."

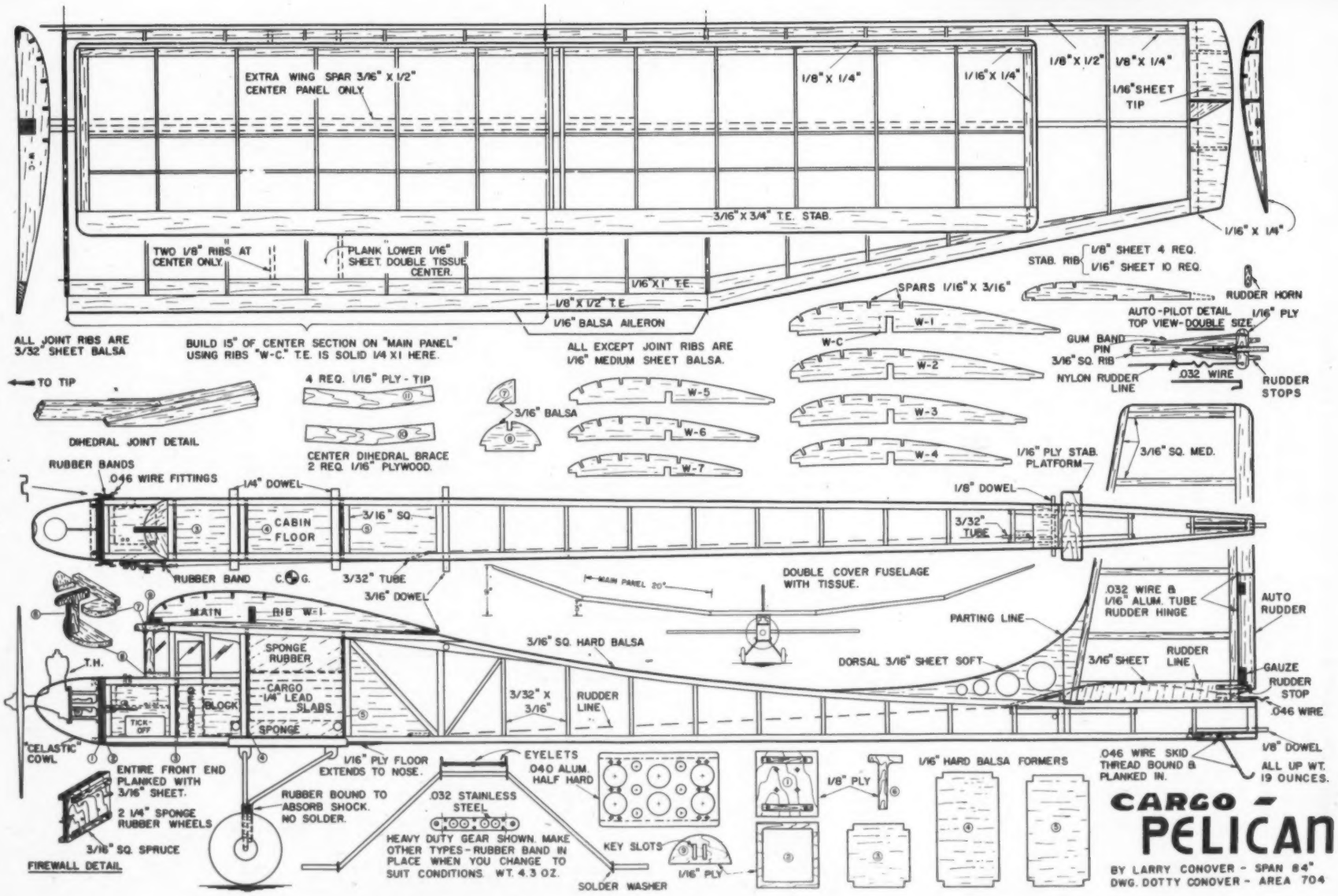
Size: The hp is the most important factor. Choose a good engine and then talk to the "speed merchants." Most any stock engine can be reworked to advantage, including Thermal Hoppers.

Hp is proportional to rpm so check through the data sheet. If you know your engine rpm on a given prop, you can determine the maximum load that has been carried at this output.

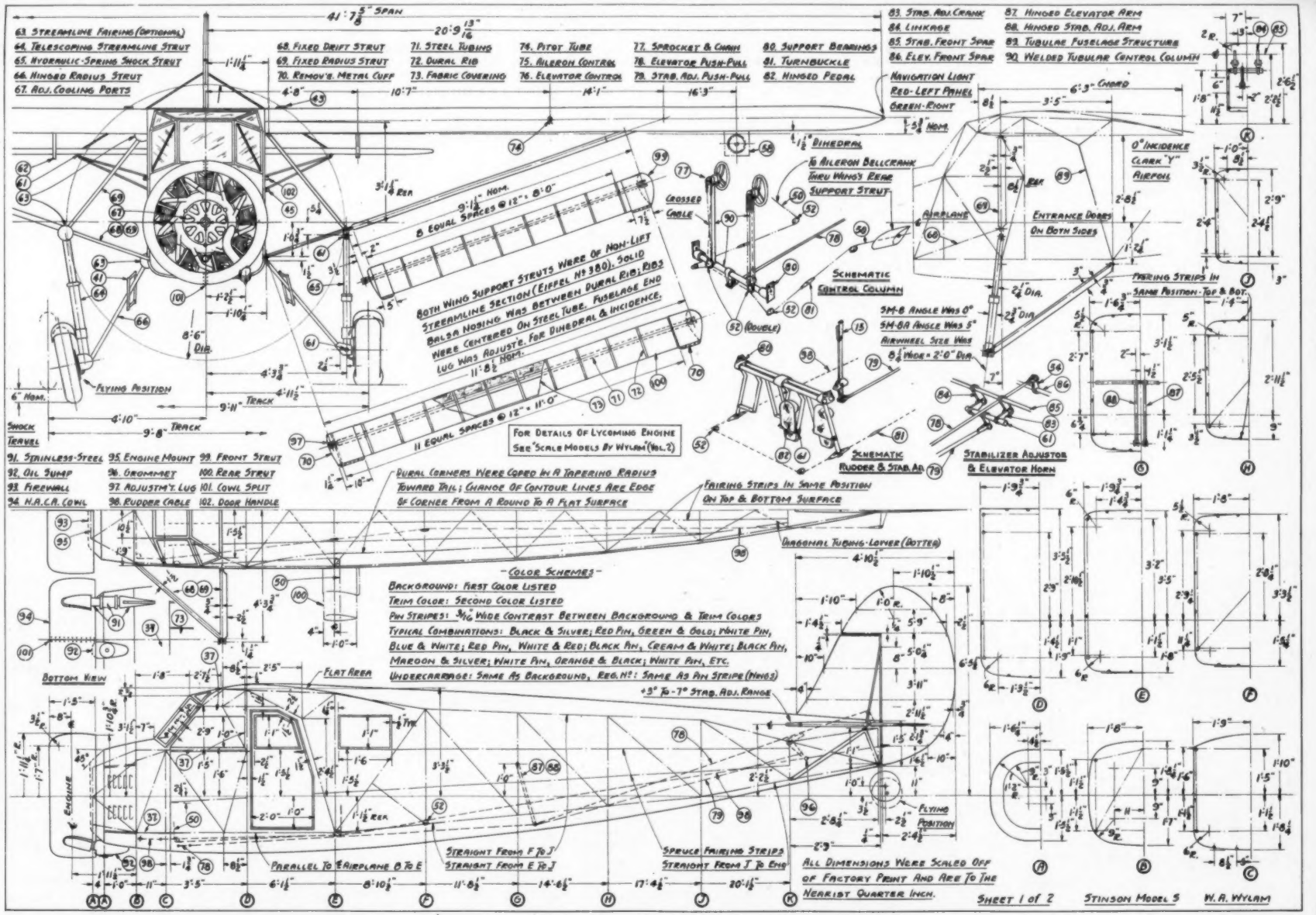
Note the relationship of wing area to rpm and load carried. They just keep getting bigger. Although the majority of the big load carriers were in the nine-to-ten-ounce-per-hundred-square-inch bracket, I have been convinced that a lighter wing loading is desirable.

This was well proven at the '58 Nationals. Don Gurnett had a monster of a machine. 1,050 square inches. An engine turning 18,600 rpm. I have 700 squares and my TH turns 19,000. Gurnett takes off with 51 ounces, shortest ground run four seconds. The Pelican with a 47 ounce load requires six seconds ground run. Gurnett needs only 30 feet of altitude. I need 50. By adding 12 inches to the center section of the wing, your Pelican will have the same capabilities. But Gurnett thinks he has too much area. He says climb is too slow. There is an optimum span-area dependent on hp. You have other variables to work with. Airfoil section, aspect ratio, tip shapes, imagination.

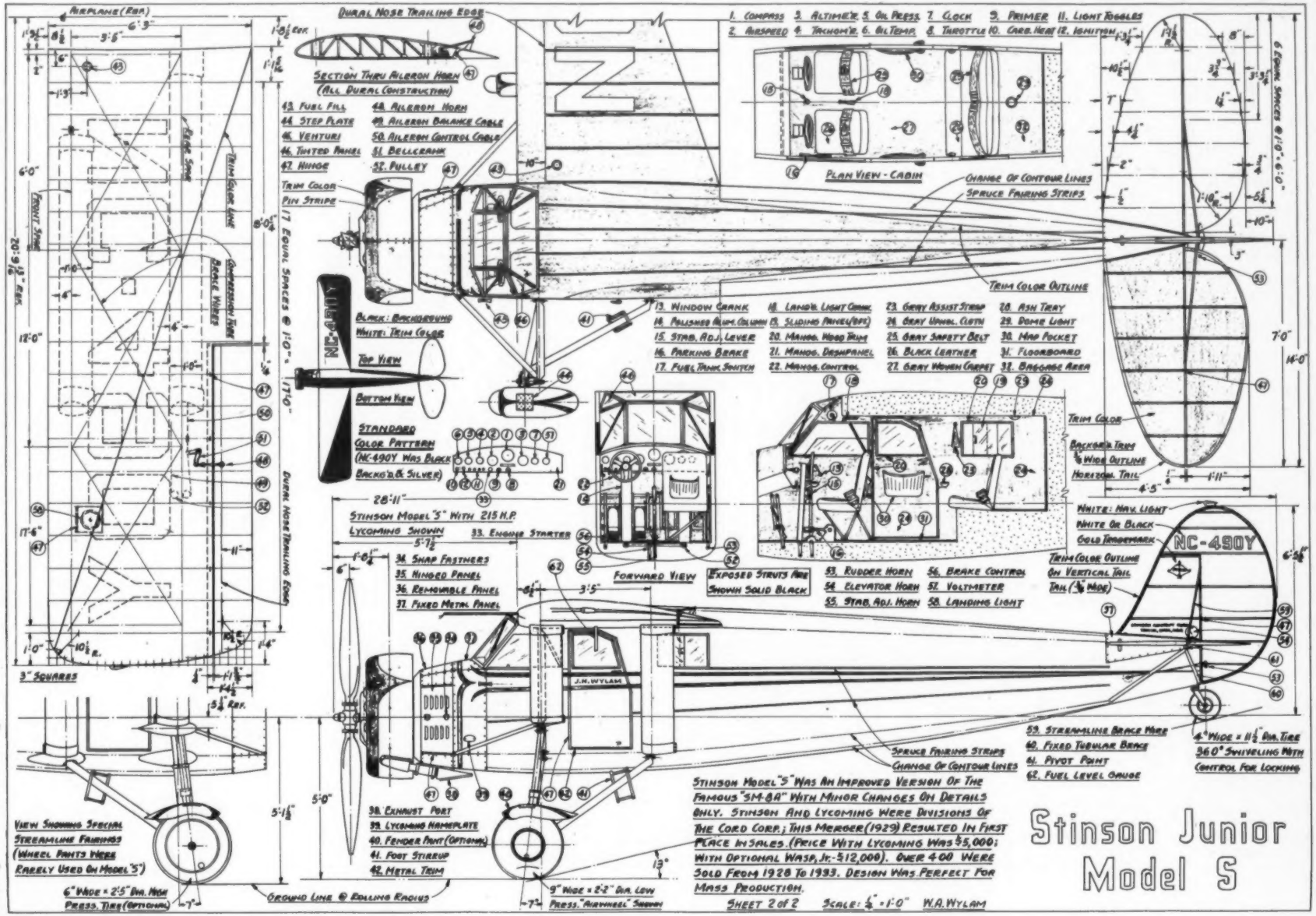
In a last (*Continued on page* 38)



FULL SIZE PLANS AVAILABLE. SEE PAGE 60


41'-7 5/8" SPAN
20'-9 13/16"
63. Streamline Fairing (Optional)
64. Telescoping Streamline Strut
65. Hydraulic-Spring Shock Strut
66. Hinged Radius Strut
67. Adj. Cooling Ports
68. Fixed Drift Strut
69. Fixed Radius Strut
70. Remov'B. Metal Cuff
71. Steel Tubing
72. Dural Rib
73. Fabric Covering
74. Pitot Tube
75. Aileron Control
76. Elevator Control
77. Sprocket & Chain
78. Elevator Push-Pull
79. Stab. Adj. Push-Pull
80. Support Bearings
81. Turnbuckle
82. Hinged Pedal
83. Stab. Adj. Crank
84. Linkage
85. Stab. Front Spar
86. Elev. Front Spar
87. Hinged Elevator Arm
88. Hinged Stab. Adj. Arm
89. Tubular Fuselage Structure
90. Welded Tubular Control Column
Navigation Light
Red-Left Panel
Green-Right
1 1/2° Dihedral
To Aileron Bellcrank
Thru Wing's Rear
Support Strut
Both Wing Support Struts Were Of Non-Lift Streamline Section (Eiffel No 380). Solid Balsa Nosing Was Between Dural Rib; Ribs Were Centered On Steel Tube. Fuselage End Lug Was Adjust'e. For Dihedral & Incidence.
8 Equal Spaces @ 12" = 8'-0"
11 Equal Spaces @ 12" = 11'-0"
Crossed Cable
Schematic Control Column
Schematic Rudder & Stab. Adj.
Stabilizer Adjustor & Elevator Horn
0° Incidence
Clark "Y"
Airfoil
Entrance Doors
On Both Sides
Fairing Strips In Same Position - Top & Bot.
SM-8 Angle Was 0°
SM-8A Angle Was 5°
Airwheel Size Was
8 1/2" Wide = 2'-0" Dia.
For Details Of Lycoming Engine See "Scale Models By Wylam" (Vol. 2)
Dural Corners Were Coped In A Tapering Radius Toward Tail; Change Of Contour Lines Are Edge Of Corner From A Round To A Flat Surface
Fairing Strips In Same Position On Top & Bottom Surface
Diagonal Tubing-Lower (Bottom)
Color Schemes
Background: First Color Listed
Trim Color: Second Color Listed
Pin Stripes: 3/16" Wide Contrast Between Background & Trim Colors
Typical Combinations: Black & Silver; Red Pin, Green & Gold; White Pin, Blue & White; Red Pin, White & Red; Black Pin, Cream & White; Black Pin, Maroon & Silver; White Pin, Orange & Black; White Pin, Etc.
Undercarriage: Same As Background, Reg. No's: Same As Pin Stripe (Nos 3)
+3° To -7° Stab. Adj. Range
Bottom View
Flat Area
Parallel To Airplane B To E
Straight From F To J
Straight From E To J
Spruce Fairing Strips Straight From J To End
All Dimensions Were Scaled Off Of Factory Print And Are To The Nearest Quarter Inch.
Sheet 1 of 2
Stinson Model S
W. A. Wylam

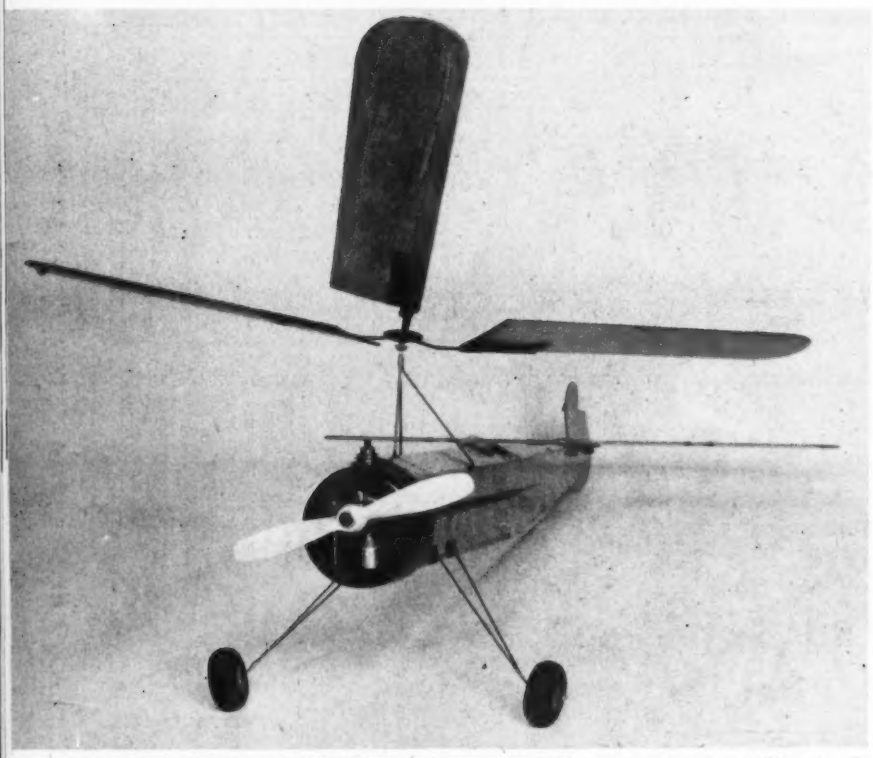
family of historically famous aircraft, the Junior makes a wonderful model subject.



Stinson Junior Model S

STINSON MODEL "S" WAS AN IMPROVED VERSION OF THE FAMOUS "SM-8A" WITH MINOR CHANGES ON DETAILS ONLY. STINSON AND LYCOMING WERE DIVISIONS OF THE CORD CORP.; THIS MERGER (1929) RESULTED IN FIRST PLACE IN SALES. (PRICE WITH LYCOMING WAS $5,000; WITH OPTIONAL WASP, JR.- $12,000). OVER 400 WERE SOLD FROM 1928 TO 1933. DESIGN WAS PERFECT FOR MASS PRODUCTION.

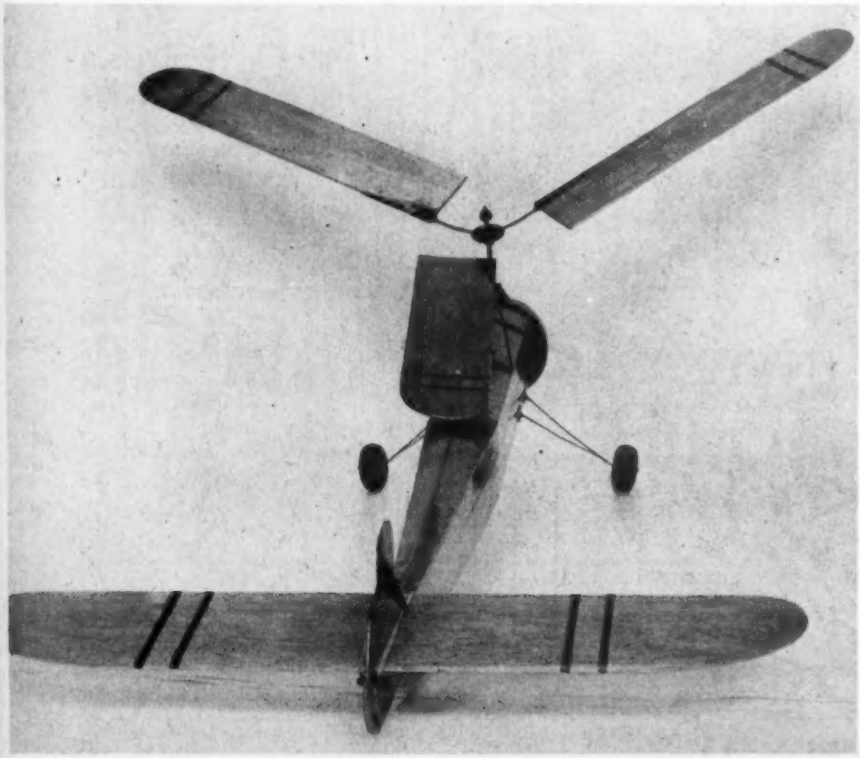
SHEET 2 of 2 SCALE: ½" = 1'-0" W.A. WYLAM



Juan de la Cierva's original 1923 'giro looked very much like our easy-to-adjust Half A aircraft.

windmill

Because the wings rotate, lift created when it stands still—come again? The new .02 the ticket!



A "machine of the future" until fixed-wing airplanes flew faster and faster, an autogiro makes a novel and excellent flying model. And so easier than helicopter.

by EDMUND MAZAN

► In 1923, Senor Don Juan de la Cierva of Spain, invented the autogiro. With safety in mind, he conceived the idea of an aircraft with a freely rotating wing. This ingenious idea made the autogiro independent of speed, for safety in flight, therefore eliminating stalls and spins which in the 1920's and early 1930's especially, caused innumerable mishaps to pilots of fixed-wing aircraft. Cierva's entirely new impression of what flying should be was welcomed by the aviation world. Despite its early popularity, by 1940 the autogiro was almost non-existent; possibly because it could not compare with the fixed wing aircraft, which at that time, were approaching speeds of over 300 mph.

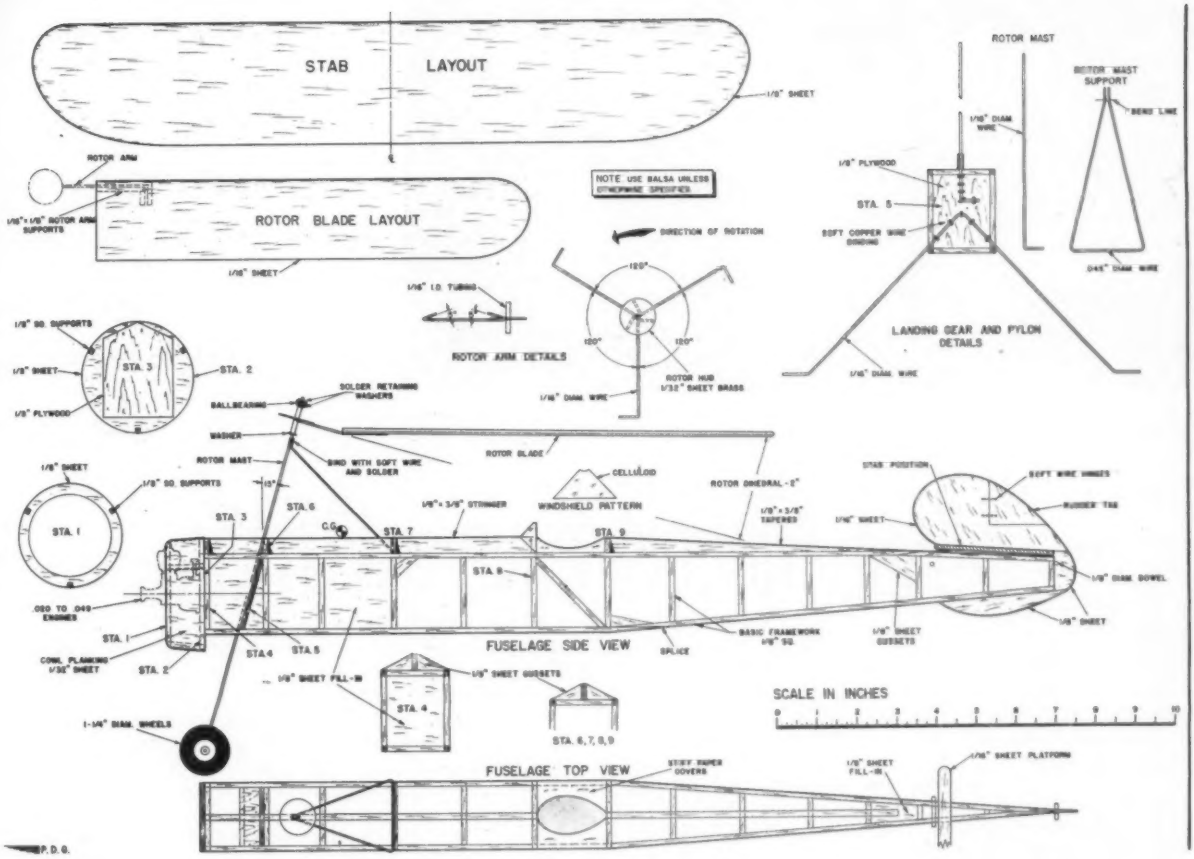
Perhaps it would be worthwhile to mention that the autogiro was not a helicopter. Lift was accomplished by a free-rotating rotor while forward thrust was derived from a conventional motor and propeller. The rotor was not connected to the engine.

The model of the autogiro is very simple to adjust. Although the angular settings of the rotor blades may appear to be complicated, extreme accuracy in setting the blade angles is not necessary.

Before attempting to construct any part of model, please study plans carefully. Construction of this model follows conventional lines with the possible exception of the rotor assembly, rotor mast and strut unit.

Fuselage: Build two sides of the fuselage from ⅛" sq. balsa. Do not add ⅛" sheet fill-in to sides of fuselage at this time. After fuselage sides have thoroughly dried, cement them together at the rudder post. Add ⅛" sq. top and bottom cross pieces, beginning at rudder post and working toward nose of fuselage. Cut and cement all ⅛" and 1/16" sheet fill-ins, with the exception of space between Sta. #4 and Sta. #6.

Cement ⅛" x ⅜" stringer to top of fuselage from Sta. #4 to Sta. #8. Cement ⅛" x ⅜" tapered stringer to top of fuselage from Sta. #9 to point shown on the plans. Add ⅛" sheet triangular shaped gussets to each side of stringer at proper stations, with exception of Sta. #7. (To be filled in later.)



FULL SIZE PLANS AVAILABLE. SEE PAGE 60

Cut following stations (see plans): Sta. #5 from ¼" plywood; Sta. #4 from ⅛" sheet balsa, and Sta. #3 from ⅛" plywood. After cutting Sta. #5, drill 1/16" holes in plywood for mounting rotor mast and landing gear at a later time. Cement stations in place.

Bend landing gear and rotor mast from 1/16" music wire according to plans. Bind gear and mast to Sta. #5 with fine wire and cement. Bend rotor mast strut from .045 wire (see plans). Set strut in place at Sta. #7 and cement remaining two ¼" sheet triangular shaped gussets over base of strut. Join mast and strut, bind with copper wire and solder. (Note—check 15° angle in mast.) Add all remaining sheet fill-ins. Fuselage now is ready for covering.

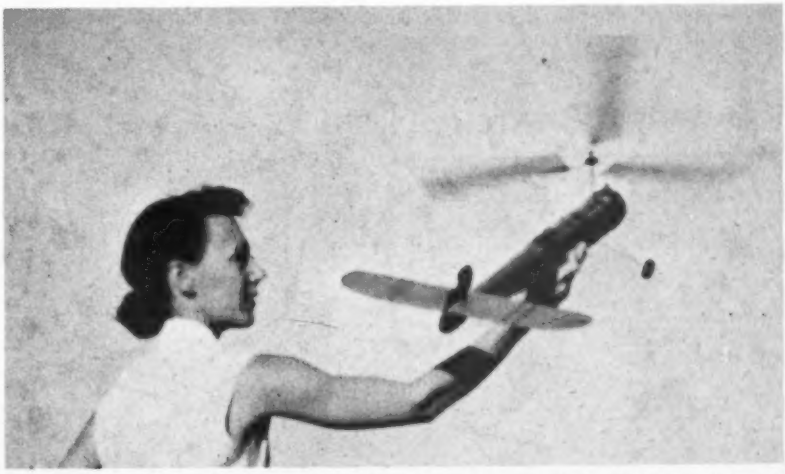
Rudder and Stabilizer: Cut rudder from 1/16" sheet. Sand all edges round. After rudder is shaped, cut trim tab and insert two soft wire hinges. Sub-rudder is made from ⅛" sheet. The stabilizer is cut from ⅛" sheet. All edges should be sanded round. Rudders and stabilizer now are ready for covering.

Rotor assembly: Make three rotor arms from 1/16" music wire. Make one rotor hub from 1/32" sheet brass or galvanized iron. Drill 3/32" hole in center of hub. Make rotor bushing from brass tubing ¾" long (1/16" I.D. 3/32" O.D.) Insert brass tubing in hub and lay rotor arms in position on bottom of hub. Arms should be 120° apart. Solder whole assembly in one unit. After soldering, turn assembly over in proper position and twist each arm end up 5° (see plans).

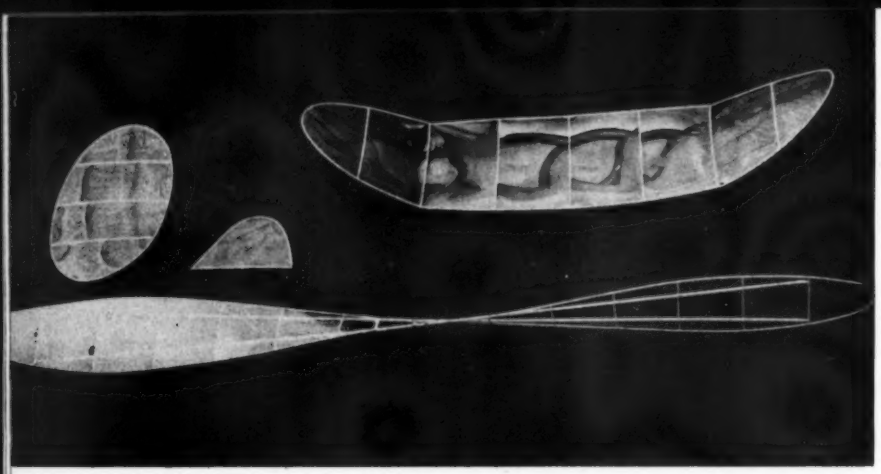
Rotor Blades: Cut three rotor blades from 1/16" sheet. Sand edges round. Cement 1/16" x 1/8" frame to bottom of each blade. Blades are now ready for covering.

Covering: Cover model with Jap tissue, including all sheet balsa parts. First water shrink tissue. When dry, apply one coat of nitrate dope followed by two coats of fuel-proof dope.

Final assembly: Add wheels and solder retaining washers to axle. Insert ⅛" dia. dowels in rear of fuselage and cement. Cement ¼" square keying strips to bottom of stabilizer. Cement rudder to stabilizer. Add sub-rudders to fuselage (*Continued on page* 57)



To launch, just walk slowly, the rotor whirling, and let go. May get 300 feet high in two minutes.



Microfilm covered surfaces—and propeller, are weighed in thousands of an ounce. The article is not the ultra-ultra answer but makes good beginning point for deft building and keen flying.

by **CHARLES TRACY**

With flying sites scarcer than free-flight 60's, indoor models are making a comeback. It's easier finding a hall than big field.

Indoor Models have a FUTURE

► Check out on indoor models! Their future is solid. Modelers in cities east of the Mississippi find cavernous halls for indoor meets easier to get than open fields for outdoor free-flight. The trend that way is more so.

There are other advantages. You "train" indoor jobs to circle and climb to fit the room. You don't need a car to chase or reach the flight site. Put models in a box and take the bus.

Indoor models are cheap. The main idea is to stretch as little material as far as possible. Motors are insignificant—a couple of feet of fine rubber, a drop of lubricant. No hot fuels—no costly batteries.

Indoor models are easy to fly when you know how to make them. They're perfect for teaching principles of flight. They're noiseless, harmless, relaxing and fun to build and fly.

The thrill of watching your indoor job fly ten minutes is equal to any in modeling. There are breath-taking moments as your tediously-built "mike" job bumps between rafters, girders and lights of an impossible-to-reach ceiling.

An indoor modeler is a combination cook, chemist, physicist, aerodynamist, and structural engineer. He's scientific to say the least.

Materials are important. Lightness is vital. Use the lightest stuff you can find. Special light grades of balsa are available if you search. Condenser paper is fine covering, easier to handle than microfilm, better to use while gaining experience. It's sold by some model shops. Microfilm comes in a bottle, or you can mix your own.

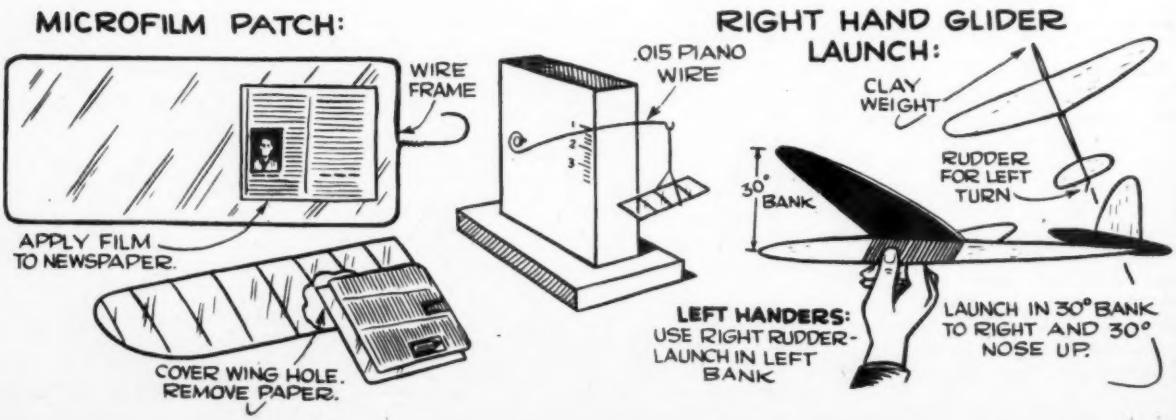
Fine music wire .015 and .020 diameters, small-size rubber strand, nylon thread from a stocking, a square inch of sheet aluminum 1/32" thick, and tungsten wire if you can assemble invisible bracing on wings, complete your needs. Indoor aces buy wood in sheets: 1/16" thick for spars or edges in wings and tails and for wing struts; 1/32" thick for motor sticks, ribs, prop blades, tail frames and tips; 1/64" thick for tail booms.

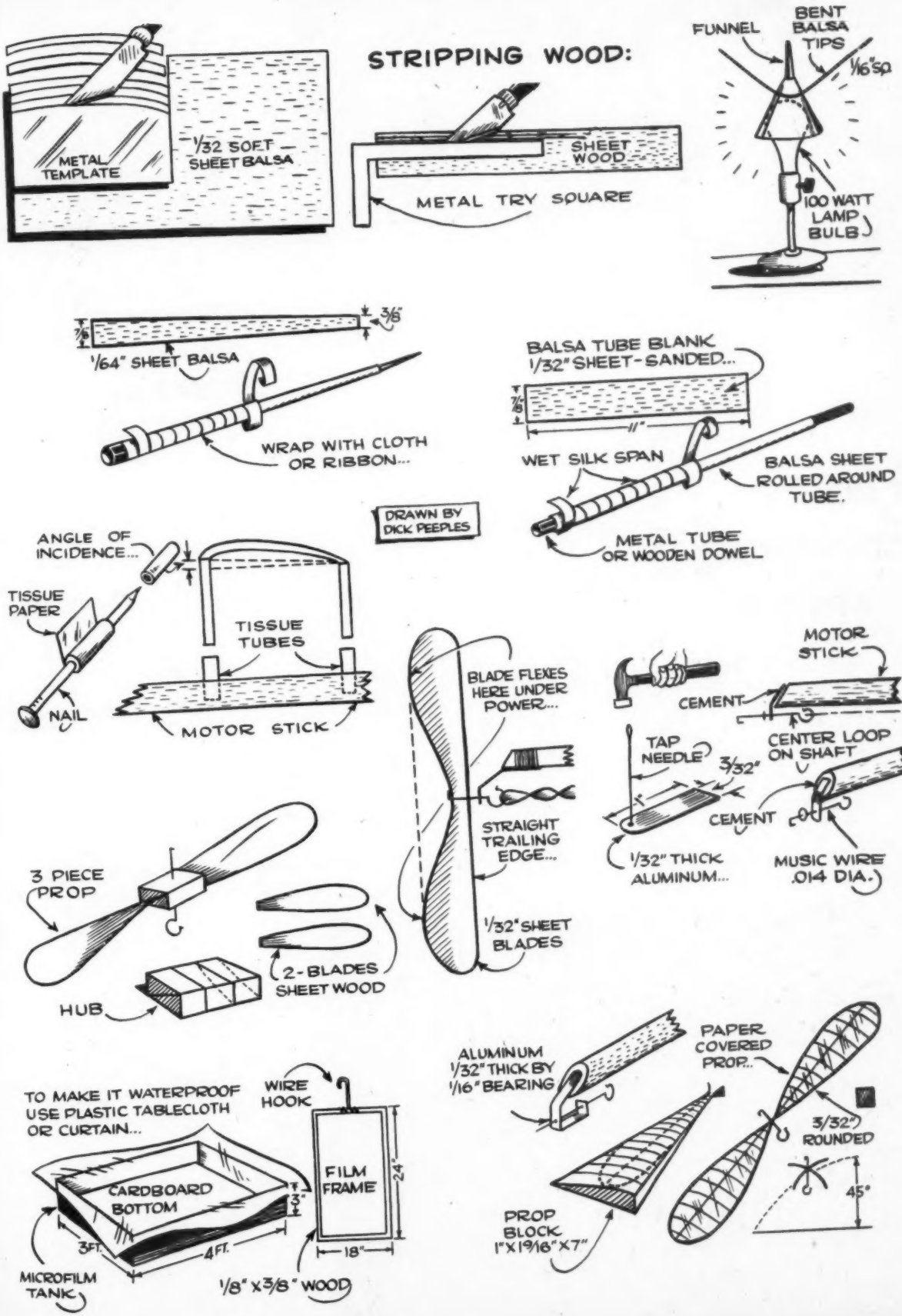
Slice it to sticks of needed size. Use a metal ruler or flat metal square, held tightly to the sheet. Cut it with a new razor blade, single-edge style. Work on a smooth board and cut with the grain of the board for smoothest results. Keep the blade sliding against metal rule.

Wing ribs are sliced from sheet wood by following the airfoil curve template cut, filed and sanded into a metal pattern made from sheet aluminum or tin. Just run the blade around the curved edge, slide down 1/16" and go again. Have balsa grain running from front to back—leading to trailing edge.

Streamlining isn't too important on indoor models. They only fly at four mph.

Tail booms are used to get wing forward for good balance. A boom two-thirds of (*Continued on page* 44)




STRIPPING WOOD:
METAL TEMPLATE
1/32 SOFT SHEET BALSA
SHEET WOOD
METAL TRY SQUARE
FUNNEL
BENT BALSA TIPS
1/16" SQ.
100 WATT LAMP BULB
3/8"
1/64" SHEET BALSA
WRAP WITH CLOTH OR RIBBON...
BALSA TUBE BLANK 1/32" SHEET-SANDED...
WET SILK SPAN
BALSA SHEET ROLLED AROUND TUBE.
METAL TUBE OR WOODEN DOWEL
DRAWN BY DICK PEEPLES
ANGLE OF INCIDENCE...
TISSUE PAPER
NAIL
TISSUE TUBES
MOTOR STICK
BLADE FLEXES HERE UNDER POWER...
STRAIGHT TRAILING EDGE...
1/32" SHEET BLADES
MOTOR STICK
CEMENT
TAP NEEDLE
3/32"
CENTER LOOP ON SHAFT
CEMENT
1/32" THICK ALUMINUM...
MUSIC WIRE .014 DIA.
3 PIECE PROP
2-BLADES SHEET WOOD
HUB
TO MAKE IT WATERPROOF USE PLASTIC TABLECLOTH OR CURTAIN...
WIRE HOOK
CARDBOARD BOTTOM
FILM FRAME
24"
3"
3FT.
4FT.
18"
MICROFILM TANK
1/8" X 3/8" WOOD
ALUMINUM 1/32" THICK BY 1/16" BEARING
PAPER COVERED PROP...
3/32" ROUNDED
45°
PROP BLOCK 1" X 19/16" X 7"

Some of the 30 members of the Indian City RC Club, Wyandotte, Mich. Ships include multi-engined, flying saucer and just about all kits.

radio control news

by EDWARD J. LORENZ

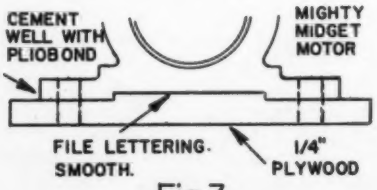


Fig.3

Duration flights, new FCC regulations, super-het receivers, alkaline batteries, plastic RC models—what next?

TECHNICAL TOPICS

► On August 24th, personnel at Cape Canaveral were sadly disappointed when Explorer V was lost. At a quiet ex-USAF field near Montgomery, N.Y., the previous day found a small group of disappointed RC'ers. While the stakes were not of the multi-million dollar category, much time and effort was expended on two ships designed to prove all-day durations are possible. The record try was a by-product of these experiments. Personnel involved were Messrs. W. Winter, N. Rosenstock, P. D. F. Chinn and E. J. Lorenz, with assists from K. Day, Ray Somner and Bill Poythress. The planes were designed by W. Winter and Norm Rosenstock; Pete Chinn took care of the engine and fuel system and yours truly checked out RC equipment and batteries.

The first take-off was made at 7:30 a.m., August 23rd, with a full load of 45 ounces of fuel for 13 hours. Take-off run in still air for the seven foot ship was 480 feet, with the width of the run track being within 25 feet. The Essco THT receiver and transmitter functioned perfectly for a distance of about 2,500 feet with the plane at an altitude of not over 35 feet. Pilot error at this distance caused a slip-in of the delicately trimmed ship while attempting to turn back. (Lesson #1: Have a second pilot with transmitter out at least 1,000 *(Continued on page 28)*

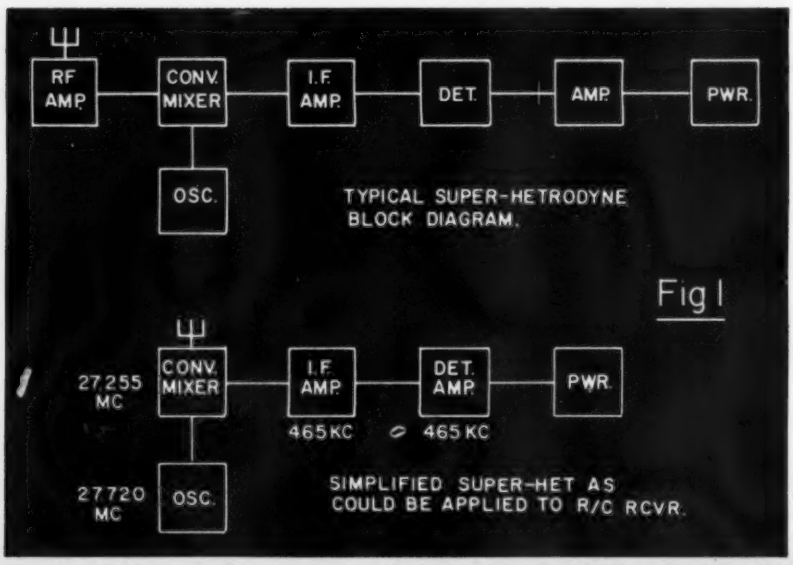


Fig I

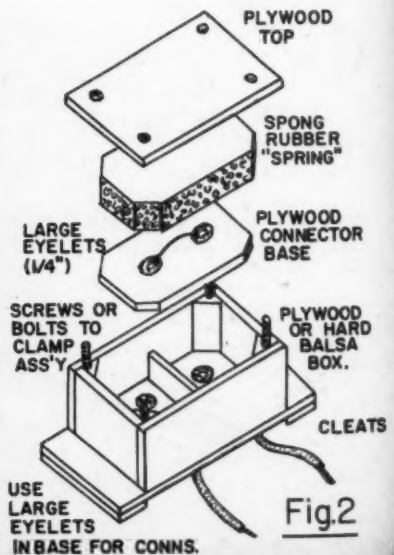
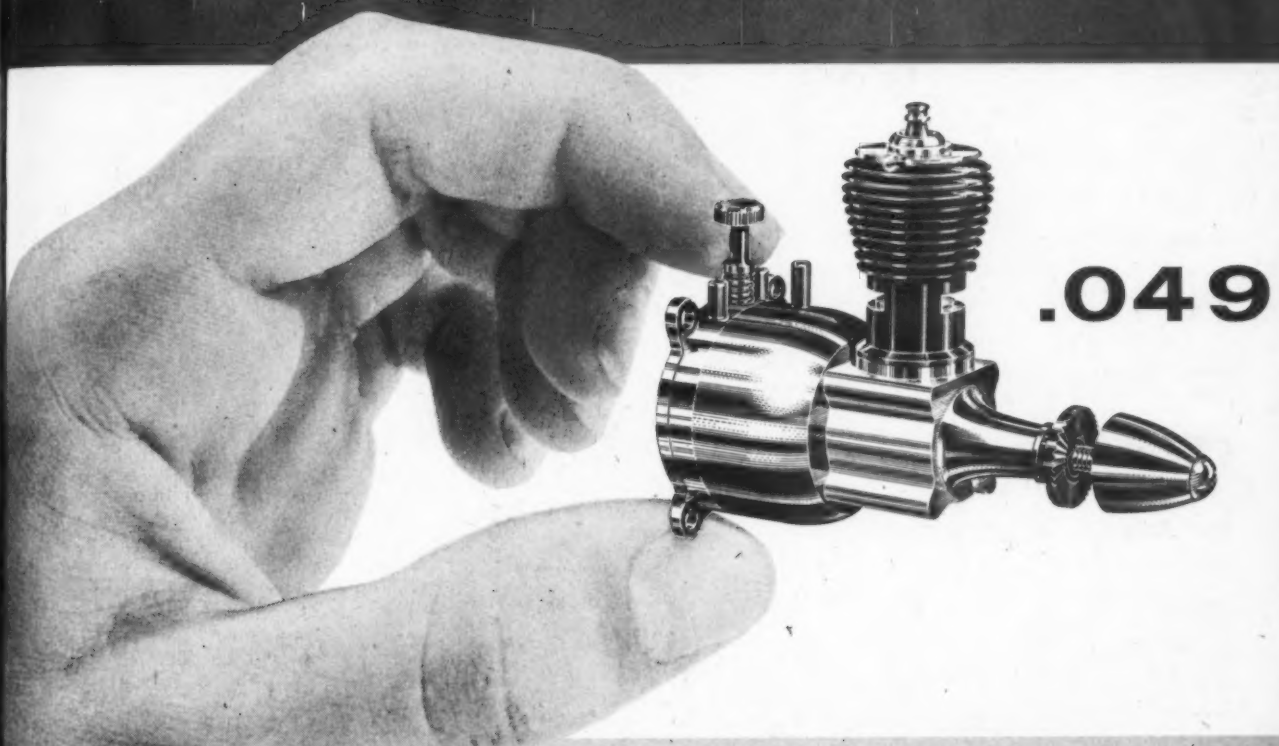


Fig.2

THE NEW *Gold Standard* IN ½A ENGINES

Thimble-Drome GOLDEN BEE



$4.95

at dealers in Thimble-Drome clear-view dust-proof packaging

The minute they lay eyes on it, model builders will thrill to its gleaming golden color and economical price! Typical Thimble-Drome 24-carat quality and performance...better than average ½A power, with the quick-starting that is a "T-D Standard". PLUS all the famous features that have made "Powered by Thimble-Drome" the symbol of dependability and performance! All-metal tank-carburetor unit, no outside fuel lines, rear needle valve, etc. AND a large size stunt type tank for longer flights.

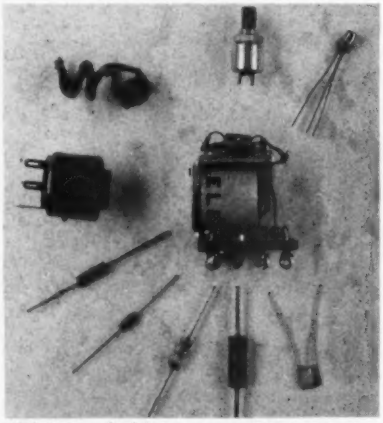
L. M. COX MFG. CO., INC. • *P. O. Box 476, Santa Ana, California*

Nat'l Sales: Milt Grey Sales • 9538 Brighton Way, Beverly Hills, California

Radio Control News

(*Continued from page 26*)

feet where he can see the model plainly. Ship number two was brought out for a few more trim flights and was ready for take-off at about 1:00 p.m. Fuel load was reduced to about 32 ounces and with a 10-12 mph breeze, a beautiful take-off was accomplished in 110 feet. Haste makes waste and in this case there is evidence to prove it. The tank was mounted a fraction of a inch too far back, a slight, a very slight, stall set in and with a gust of no more than 15-18 mph, the plane was dashed into a ground obstacle before it had gained sufficient altitude. The CG RT-1-3V with VO-500 cells performed perfectly during all tests, using the CG-T-12 and Bramco single channel tone transmitters.



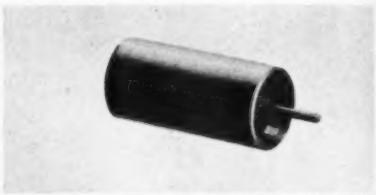
Miniature, subminiature components—see copy, compared in size with the standard Gem relay.

Why do we tell of such a horrible failure? In the first place, all concerned did not consider it a failure. Much was learned and we have the consolation of knowing that it was not due to mechanical or radio failure. From time to time we will give data on the equipment tested and why it was chosen. Time permitting this year, and most certainly late next spring, other attempts will be made. Perhaps it is well that Alaska is now a state. This will allow a citizen of the USA to try for a 24 hour flight in the land where the sun never sets for part of the year. A 24 hour RC flight is impossible? Wouldn't say that!

Compact A Compound Actuator, 200 ma drain, has "muscle" for boats and engine control.

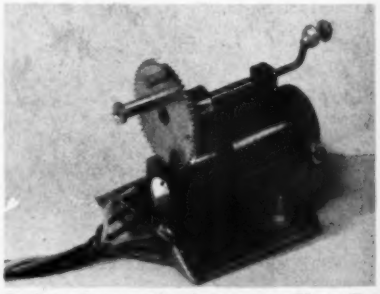
• • •

Let's take a closer look at some of the equipment requirements on the new frequencies. The transmitters will very likely remain much the same, except for a general cleanup in design to improve stability and efficiency. The receiver, however, will come in for the greatest face-lifting. But before you throw up your hands and walk away, we want it known that there isn't a single piece of equipment on the market or in the field (assuming it is properly designed) that can be called obsolete. True, these are super-regenerative receivers and therefore are not as selective as now needed, but they will work and can be used in any area which sticks to any one of the operating frequencies. Just think what these new frequencies may mean at future big contests. Five to seven ships could be in the air at a time, more flights flown and more chance for added events. Single and multi-channel equipment can be built for any of the new frequencies. However, don't hold your breath for a "universal" converter which can be attached to any and all front ends to make the receiver more selective.



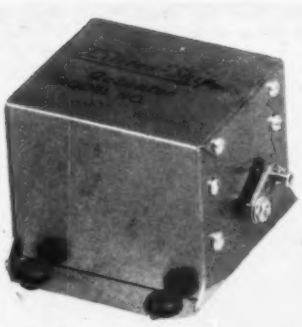
About 2½ in. long, 6-12 volt DC motor, the Moon Trading Co., 3000-6000 rpm 50-150 ma.

Fig. 1 shows a block diagram of what is required for the average super-hetrodyne circuit. Basically, the circuit employs an oscillator which can be either above or below the frequency of the incoming signal; however, in most cases it is higher. The signal from the oscillator, say 30mc, is fed into a mixer stage. Into this mixer also is fed the frequency of the incoming signal, say 27mc. The difference in frequencies is called the IF frequency; in this case it is 3mc, and it is this frequency that is then detected and amplified. Some very, very small super-het sets have been built, using transistors. Not much larger than a pack of king size cigarettes, these receivers have self-contained batteries and a speaker, so you can see a compact unit can be built for RC use. As stated last month, our British RC builders have been using this type of set for a number of years, with the receiver and transmitter designed by Mr. David McQue.

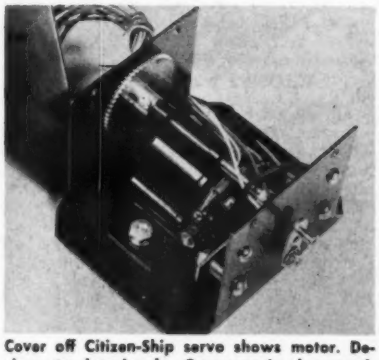


Go-Around proportional actuator, Glass City Model Electronics, based upon Mighty Midget.

Fig. 2 shows the battery box used and designed by Herman Rau of NYC, for use with the VO type cells. The box is easily constructed of hard balsa or plywood, the height of the box being determined by the thickness of the cell used. Contact pres-



New Citizen-Ship servos come all common types, kits and built-up models. Mighty Midget.



Cover off Citizen-Ship servo shows motor. Design sturdy, simple. Compact is the word.

sure is maintained by the foam rubber pad. Parallel leads may be brought out to a socket, mounted flush with the side or inside the installation, so that a plug can be inserted for charging.

We don't have all of our test graphs plotted yet on VO cells but would like to mention that they are well worth the extra cost. Herm has switched to these in his multi job and can now operate two servos simultaneously, to full efficiency, without a noticeable voltage drop from the cells. Even with two D cells, the voltage drop was in the order of a half volt. In addition, the VO cells do not leak and are not damaged by high overloads and can be recharged in excess of 500 times. So far we've gotten up to 15 rechargings on our VO-800's so will have to take the manufacturer's word for the 500 figure. We hope some manufacturer comes out with a series of cell holders for the VO series.

Fig. 3 also comes from Herm Rau and shows his method of securing the Mighty Midget motor to a base without extra straps, etc. This has been proven quite effective and is simple to build. File off the raised printing from the center section of the MM motor and cement to a suitable plywood base with Pliobond cement. Allow the cement to dry about 24 hours for maximum strength. The plywood base should be routed or cut out to fit the step in the motor. Regular screws or bolts can then be placed in the regular mounting holes.

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Additional information from the FCC: mail your form 505 directly to the Secretary, FCC, Washington 25, DC. DO NOT send to regional offices; all old 27.255mc gear is perfectly legal and usable until June 15, 1963. There is no need to buy a new crystal for 27.255mc work, although many manufacturers will have the new frequency tolerance crystals in their equipment. (C.G. (*Continued on page 57*)

MAN at Work

(*Continued from page 7*)

someday take both Wakefield and gas!

For us the problem is not hopeless. Let's start with the clubs. Emphasize FAI events and models in interclub affairs. Co-operate with and push, not gently, dear old AMA, on its next, long-drawn out mail ballot on rules, to emphasize FAI at the Nationals, and at all other meets. Half A, A and B, B and C—oh, fiddlesticks. Some of us have grandfathers who flew such events. Let the magazines support and encourage FAI events. Let the manufacturers kick in—every year. For heavens sakes, if we must get our lumps, let's do it right! We can't go home.

• • •

► Which ten free flight models contributed most over the past 20 years? A famous designer names these ten, in order: Satellite, Hunter; Ramrod, St. Jean; Civy Boy, Gilliam; Sailplane, Goldbergh; Zipper, Goldbergh; Hogan, Davis; Zeek, Mahieu; Fubar, Matthews; Kiwi, Mahieu; Spacer, Taibi. In our book, the Zipper is head and shoulders above them all—on its record . . . from David Ashton, Pres., Rocket Research and Development Society, Houston, Texas, word that the spectacular pic on page 9, the August issue, was of their January 25, 1958 rocket launching. The shot was one of a long series to study stability at relatively low speeds encountered at launching and apogee, and of transonic speeds at brenschlaus. The rocket used micro-grain zinc and sulphur, a type of engine tested by the Society on numerous occasions with 100% reliability. When the pic was taken, the rocket was 160 feet in the air, going 700 mph. It reached 10,000 feet at 750 mph. Again, we caution younger readers that such rocketry requires education, organization, a remote, safe site, and supervision . . . manufacturers should put mufflers on engines, write many modelers. Tain't so. Mufflers have been on the market before. Modelers won't use them. Say you lose power. For sport use, can't see that it matters. It's the noise they love—and the neighbors hate. Bob Whales, Will Fly Committee, Pasadena, suggests a muffler event at the Nats for the quietest engine.

• • •

► A $1,000 scholarship is the big award at the Fifth four-day King Orange Internats, December 27 through 30, Miami. Amount is the maximum for citizens of Dade County, Fla., but will be increased as funds become available for other contestants. Particular award open to anyone under 21, from any country. The King Orange meet is the big wintertime deal and the sunshine is no handicap. (Exchange Clubs Youth Aviation Association, 5313 Granada Blvd., Coral Gables 46, Fla.) . . . World's Biggest Indoor Meet (Charles Tracy, Cleveland Press, Cleveland 14, Ohio), the 8th Annual Great Lakes Indoor Meet, will be held December 28 in Cleveland's Public Hall. Six age divisions, 70 trophies. In past years, entrants run as high as 500. No admission or entry fee. Floor 120 x 240 feet, ceiling 90 feet, clear of rafters, wires, PA systems, etc. This is a better deal than the Nationals Indoor event and they even supply gas balloons to recover models that hang up on a couple of lights that cannot be moved. Overnight accommodations at Auditorium Hotel, E. 6th and Lakeside Ave., across the way. HL Gliders, paper-covered stick, microfilm stick, pre-fab cabin types from commercially available sheet wood kits. This

column doesn't announce meets but this is the Number 1 Indoor Event. Support it . . .

• • •

► Combat is fine for people who like to throw switches under toy trains. To reduce the carnage, Bill Johnson, 6328 Jackson, Berkeley 21, Mo., has a dilly of an idea that his St. Louis area CD's are supporting. This is a stiff paper tab, about two inches long, with reinforced holes at either end. Between it and the plane is an 18 inch leader string, and between it and the 7½ or 8-foot streamer, is a 2½-foot string. In front of the tab is the Safety Zone (the short string and the plane), and a hit here means elimination for the attacker. Between the tab and the streamer is the Kill Zone. The streamer is the Cut Zone. A plane flying inverted is eliminated if a crash occurs (2 planes flying) and flying wires are considered part of the safety zone. In their Hazelwood Contest, August 31, there were no mid-air collisions! You can't use the model as a cleaver to win. Win or lose, take home a whole plane, urges Johnson . . . most popular rubber job at the Nats was Hatschek's 1957 Mulvihill Winner (January '58 MAN). It won again the '58; and holds present record of 18 minutes plus . . . Hot club in Greenville, S.C. (Jack Swan, 802 Texas Ave., Rt. 82), started last July, has 32 members who fly anything and everything . . . Saguaro Spinners (Lowell Peterson, 5607 E. Mable St., Tucson, Arizona), 16 active members, mostly controlline. Willing to branch out . . . Hobby Industry Association paid round-trip expenses for eight modelers to the Nats under their state eliminations scheme. Get your state to run such an eliminations . . . From Art Heinrich, a modeler since 1903, and that's not a misprint, pix of four of his twin-pushers, built in 1926, '28, '32 and '55. Props on these feather weights turn 500-600 rpm's. In August, 1957, the 1926 job made two consecutive flights at 7 am of 2:10 and 2:8 on 1,000 turns.

• • •

► Intriguing discussion about down thrust with Zeigenfuse. Has 150 sqs. Half A bomb that did 2:50 to 2:55 on Atwood when engine new, on 7-8 sec run. Engine wore, so duration down to 2:00–7 to 8 secs on run. Flew right power, left glide with 1½ degrees difference between wing and tail. Required seven degrees downthrust and ship real tricky on launch. Then flew it right-right, and required no down thrust. Duration jumped to 3:00 to 3:05, still on 7-8 sec run. Tame as a lamb, too. Z thinks it is because a tilted slab with left side up—as you look at it from nose—presents actual stab area to horizontal line when ship banks. But, with right hand turn—looking from behind, now, a stab tilted the other way, presents greatly reduced area to horizontal . . . Here's one for the books: Bill Deegan, formerly city manager for Quincy, Mass., while on a fishing trip in James Bay and Hudson Bay got an Eskimo whale hunter to take him to a remote island site of 800-year old ruins. As the story goes, a tribe of giant Eskimos used handy stones to make dwellings along the bleak shore. Standing there, amid thousands of stones, Deegan picked up a sample and under it was a flattened tube of Ambroid. From the number on the tube, Ambroid established the date of manufacture as 1949, unfortunately proving the tube was not 800 years old. How did it get there?

• • •

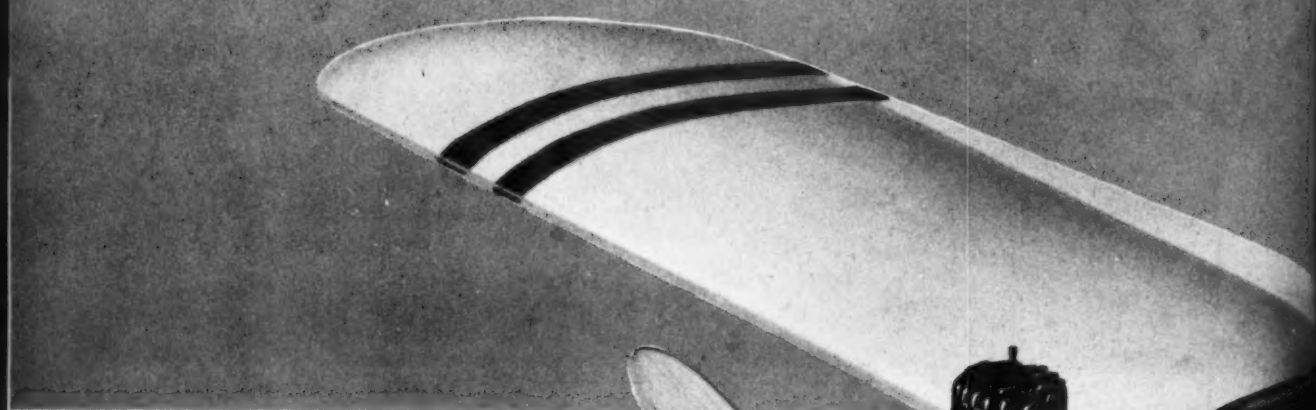
► Never underestimate the power of a

(*Continued on page 34*)

TESTORS

FRESHMAN "29"

U-Control Trainer Plane



. . . designed for use with the

McCOY "29"

RED HEAD STUNT ENGINE

$10.00

A WONDERFUL
CHRISTMAS GIFT
to give . . .
or receive!

Best for Beginners

Construction-wise, this outstanding kit has no equal for fool-proof precision assembly — and the only tools you need are pliers and screwdriver! All parts are completely shaped . . . come pre-marked for proper positioning, complete with dowel pin guides or pre-drilled holes for perfect alignment . . . even the hardware is pre-formed to insure correct fit and placement . . . screws are furnished. Because the engine mount and entire lower half of the fuselage are hardwood, sturdy structural frame-strength for withstanding shock and strain is an important feature of the plane. From the flight standpoint, too, Testor's Freshman "29" Trainer is ideal for the beginner. It is easy to adjust . . . easy to fly . . . very stable . . . can be set to do simple stunt patterns. This plane is designed for use with the McCoy "29" Red Head Stunt engine, and has been developed in accordance with Testor's exacting standards for rated achievement levels of construction and performance. Buy it . . . fly it . . . now! (Also available: Testor's "35" U-Control Trainer Plane for use with the McCoy "35" Read Head Stunt engine.)

$5.95

woman. Mrs. Vogel, Yonkers, N.Y., got madder and madder about the modeling kids getting kicked out of parks. After a series of pitched battles, with newspaper publicity, the gallant lady astounded the local model leaders by obtaining use of the South parking lot, of the Yonkers Raceway, for model flying three hours on Saturdays. Hear that the program will expand and that the track will even sponsor meets, with trophies yet, and may even put on the inevitable air show. Brown's Hobby (Ki 8-5422), if you can't get info from the track. Mrs. V. should manage our international team!

► Go-go outfit, Streator Model Busters Club, (Howard Halm), Ottawa, Ill. 48 members. Streator Hobby Show, 28 models displayed. Meetings, first Mondays . . . apologies to the Vancouver Modelers for not printing that contest calendar—can't even print the AMA calendar these days (it is free to members anyway). After mentioning a free flight field 60 miles away (what, in British Columbia!), and a nippy wind, signs off with "Greetings From the Banana Belt." . . . . bibliography of 437 aviation books from Len Morgan, 3058 Newcastle Drive, Dallas 20, Tex. What you want, and plenty you never heard of. East Baton Rouge Parish Sky-O-Rama, August 23-24, was occasion of Capital City Open Model Airplane Meet, works sponsored by the Junior Chamber of Commerce. . . . Something worthwhile to try, the new Matty Sullivan nylon bellcrank . . . if you hate to mount engines, try the Safe-T-Lock, It's one of those Kap-Pak items. Even beats blind nuts, if you ask us. And to think we once soldered nuts to tin plates! The Safe-T-Lock is a unique mounting bolt set—easy to install and nuts can never come loose. Mort Kapp, chip off the old block. Remember when his pa started Comet with a couple of other guys we knew—and don't ask when!

Snap!

(*Continued from page* 11)

top sheet now can be cemented in place. Do not cover the top, sides and fuselage bottom until the wing, tail, and controls are in place.

Choose four hard ¼" square strips for the wing leading edge and spars. Accurately trace and cut the airfoil pattern you have chosen from ¼" plywood. Push two or three pins through this pattern, allowing them to stick through the bottom side 1/16" (the thickness of the rib stock). Cement these pins in place. Using a sharp balsa knife, you can now cut the ribs out, one at a time, lightly block sanding each one down to the pattern before removing. Remember that only ten ribs have a rear spar cut-out. All ribs are 1/16" sheet balsa except the two center ribs, these being ¼" sheet balsa. The ¼" center ribs eliminate the need of center section sheeting, allowing more accessibility for control hook-up. The wing is assembled by pinning the bottom spar on the plans, cementing the ribs to it, then cement the leading edge, top spar, and the ¼" x 1" medium hard trailing edge in place. It will be easier to slide the ten center ribs onto the rear spar before placing them on the plans. The wing tips are carved from soft balsa. The inside tip is hollowed out; the outside tip is left solid. Remember to cement one ounce of ballast in the outside wing tip.

Cut the ¼" plywood control mount plate to shape making sure the control mounting holes are drilled where indicated. Don't forget to cut the slot to clear the Plane Unit pin. You now can bolt the Plane Unit to the control mount plate, and cement the plate securely in place. Strips of ¼" square balsa may be cemented along the edges of the control plate and center ribs for additional control plate mounting security. Mark the wing tip control wire lead-out hole positions. They should be drilled approximately ¼" above the center line of the rib for a level non-banking flight attitude. Cement the 3/32" aluminum lead-out tubes in place. The lead-out cable clearance holes can be cut out in the ribs by pushing a piece of 1/32" steel wire through the tip holes and ribs, to the proper hook-up locations on the Plane Unit. Use a sharp pointed balsa knife to cut approximately ¼" x ¼" deep slots in the ribs for the cables to go through the wing. The lead-out wires should be heavy stranded lead-out cable. Wrap all connections with fine wire and solder. Do not tie the cables at the wing tip until pushrods are connected to the elevator and exhaust slide. As you will notice at this point, the completed wing is light-weight, yet strong. The ribs are cut from thin material but are spaced closer than usual, giving a smooth low-drag airflow.

Cut the horizontal tail surfaces to shape, drilling the holes in the elevators for the Veco No. 340 Control Horn before sanding to a streamlined airfoil section. Slide the elevator horn through the fuselage sides before mounting to the elevators and cementing the aircraft pinking tape hinges in place. Align the wing and horizontal tail assembly properly through the fuselage before cementing them in place. You may find it easier to cover the wing before sliding it through the fuselage.

The elevator pushrod is 1/16" steel wire. Slide two eyelet pushrod guides onto the wire before bending to shape and installing. Check freedom of action before cementing the pushrod guides to Former No. 5 and No. 6. These guides are important for smooth and positive control.

You now can mount your engine and connect the Vari-Speed exhaust slide pushrod. Remember to use one flat washer for engine offset. Notice the pushrod idle adjustment V-bend which allows length adjustment to be easily made.

Your local hobby shop can get an engine for you with the Vari-Speed exhaust slide already installed. If your present engine is not so equipped, you can send it to Bob Smurthwaite, 2460 Clark St., Baker, Oregon, for a guaranteed installation. This is a close fitting installation and should not be attempted unless you are an expert machinist.

You can now apply several coats of butyrate dope inside the tank compartment for hot-fuel proofing. When installing the fuel tank, be sure it is level with the needle valve. Cement the tank solidly in place with ¼" square hard balsa strips and balsa gussets. I used a Froom T21C three-ounce tank, giving long flights for sport use.

The landing gear is bent from 3/32" steel wire and mounted with J-bolts. The original Snap used 2¾" M.S. Airwheels, manufactured in England for Aristo Craft, Newark 5, New Jersey. These wheels are of the very realistic lightplane type, are lightweight and give soft landings. The landing gear struts are held in place by a 1/32" steel wire which is wrapped and soldered to the main gear struts. After sanding the struts to a streamlined section and cementing them to the gear, wrap and cement a strip of nylon around the struts and gear wire. Install the wheels by soldering a 3/32" I.D. washer to the axle on each side of the wheels. File a notch at the end of each hub and wrap with fine wire before soldering and you will never have to worry about losing wheels while in flight.

Bend the tailskid and bind to the ¼" plywood mounting plate before cementing

in place. Cover the top fuselage sides with medium 1/16" sheet balsa. Excess pushrod length should be filed off the connection to the elevator horn so that it will not rub the top sides when they are cemented in place. Cement the fin and rudder in place. As indicated on the plans, the rudder is offset ⅛" to the outside of the circle.

Cement the ¼" sheet cowl doublers in place. The doublers allow the nose to be rounded by carving and sanding per the top view on the plans. Remove the engine and thoroughly hot-fuel proof the engine compartment with butyrate dope.

The removable hatch that covers the engine, tank, and control compartments is carved from ½" soft sheet balsa. If desired, you can hollow it out slightly between the bulkhead positions to save weight. Be sure to hollow out at the exhaust slide movement point. Cement ¼" square alignment keys to the inside of the hatch. The hatch hold-down screw, screws into a short piece of ¼" square hardwood cemented onto former No. 2 and held firmly in place with a strip of nylon cemented over it. Cover the bottom of the fuselage with soft 1/16" sheet balsa, running the grain across. You will have to wet the sheeting on the bottom of the nose to permit curving.

Block sand the top and bottom seam joints of the top side sheeting. Sand the entire structure with fine sandpaper before applying two thin coats of clear dope to the bare wood. Lightly sandpaper again before covering. The fuselage and tail surfaces can be covered with light-weight tissue and given approximately three coats of talcum powder and clear dope mixture for a sanding sealer. The wing should be covered with colored silk and given a finish of six to eight coats of thinned clear dope. One coat of clear should be applied over the fuselage and tail surfaces before masking them off for colored dope application. Be sure the dope has dried several hours before applying the masking tape. My Snap has a finish of butyrate yellow with brown racing numbers and trim, giving it the appearance of a racer.

Lead-out wires can be tied easily by using line connectors and tying directly to the Flight Control control handle as a means of measurement. First, tie the elevator (front and rear) cables even in length with the elevator in neutral position; then the power cable (center lead-out) to the center connection on the control handle, making sure the throttle trigger control is back, at top speed setting.

Your model should balance no further than 1¾" back of the leading edge of the wing. My version balanced perfectly without adding ballast. Assuming that you are using the elevator control horn length shown on the plans, your Snap should not be too sensitive on the controls. If it is too sensitive, move the center of gravity forward by adding ballast to the nose. The forward position is especially good for beginning modelers as they usually tend to over-control.

After each test flight, you should experiment by bending the exhaust slide pushrod V to close the Vari-Speed slide as much as possible to obtain the slowest idle speed your engine will permit without dying. You probably will be using an exhaust opening of 1/16" or less when the control handle trigger is forward to give full idle speed. The idle opening adjustment will vary with different engines. You may want to install a very light spring to the exhaust slide pushrod, to hold idle speed for unassisted take-offs. A very weak spring is sufficient for this application as it is assisted by the engine vibration to keep the slide closed at idle setting.

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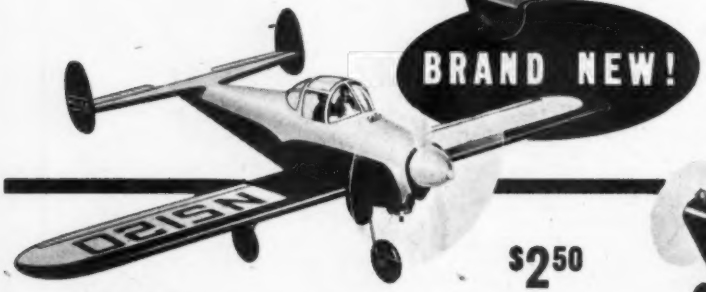

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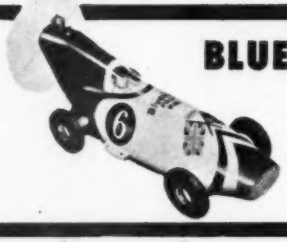

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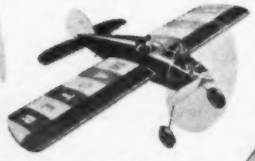

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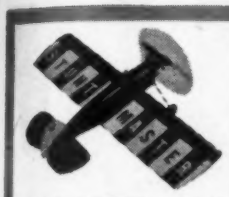

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Pelican

(*Continued from page* 18)

ditch effort to beat Gurnett, the Pelican got off with 63 ounces of cargo. When the motor cut going down wind, the bottom (air) dropped out and the pilot made a screeching belly landing.

Weight-strength: Again check the data table. Lang had excellent light structures. Roth built the lightest yet for such a large model. I remember watching his Blueboy flexing wing tips as much as six inches in the wind. C. O. Wright had a good all-round ship with a lower aspect ratio wing. He won in '55. It's a point for discussion: Was Lang's (44 ounces off unofficial) higher aspect ratio model more efficient?

Both Gurnett and Yardley have immense air frames for a mere 20 ounces. Imagine flying a Comet Sailplane with a ¼A engine!

Durability is cheap. When your all up weight is 50 to 70 ounces, three or four more invested in harder wood is good business. The "three-flight" PAA rules make it a necessity. The Pelican has gone through four seasons of active contest flying weighing an average of five ounces more than the competition. Both Lang and Schoenky have advocated, "A certain amount of flexibility is the key to a strong light model."

The cargo compartment must be a strong box. Hard balsa, interlocking construction, cement, cloth, fibre glass. Easily accessible. Sponge rubber above and below the weights. An extra section forward so you can add weight to shift CG.

A neat trick is to establish a solid column of blocks and structure between the point of impact and the cargo mass. No space left open for the weight to get a running start forward. Knock-off pods provide a safety measure for rough landings but they must remain secure to qualify for an official flight. Frank Ehling and Ed Veselsky have used triangular shaped weights that pop out the bottom on hard landings.

Back in the days when 30 ounces of cargo was regarded as wild speculation, one confident fellow cast all his weight into a solid chunk. It fit the cabin very nicely, and test flights at home were outstanding. When he arrived at the Nationals, weather was poor. Engines ran sickly. Take-offs tough. He couldn't make it with the total weight, and there was no way to reduce it. Ever try to carve a hunk of lead two inches thick? Well, some things are learned the hard way.

Wing: The aspect ratio of the wing must be a compromise between a desirable long span and a reasonable strength to weight ratio. The Pelican is 9:1.

The airfoil section is very important on cargo models. I do not know of any systematic investigations on the problem. It might be worthwhile. Lang, myself and Gurnett have used the MVA 301 with success. I'm not convinced it's the ultimate. The airfoil should employ some means of self-turbulation. Either a sharp leading edge, or multi spar construction topside, or threads on the surface. The flow must be able to "hang on" in the gusty conditions found at low-level operation. The wing should be set at a higher angle of incidence than the normal gas job. Three to five degrees depending on section, load, etc.

Take-off: Many of us have settled on a simple two-wheel gear slightly forward of the CG. Schoenky had good luck with a tricycle gear on his Pacific Clipper. The front strut adjustable to set takeoff angle. Blanchard uses three wheels also. C. O. Wright likes large wooden wheels on a short gear, near the CG.

I use solid sponge rubber wheels for most of the flying. Medium diameter (2½ inches) and a sturdy long gear. It is heavy but you get more consistent take-offs under all conditions. The saddle mount allows easy replacement and simplifies fuselage structure.

From K. Q. White I learned not to solder a landing gear. It should be bound together with strip rubber. Scotch electrical tape over this protects it from oil and sunlight. Now, if the gear hits extremely hard (and cargo ships do) it gives at the joints. You can replace the binding if necessary. The gear should be long enough to allow a steep bank on take-off, and still keep the wing from scraping. It also pays off when you roll past the end of runway boards into the grass.

If you haven't the facilities to make the saddle shown on the plans, split some ¾ inch dowell. Cement it securely on the bottom of the fuselage to form channels for the top of the bent wire gear. Rubber band on in the same manner as the original.

John Yardley first tried an immensely complicated (but well done) auto-steering mechanism that worked off the front wheel. It weighed eight ounces. His next approach was completely the opposite. A simple co-rotating system that weighed 1⅛ ounces. Gurnett uses the same basic type. The wheels are fixed to and rotate on a common axle. The only way it can get off course is for one wheel to go faster than the other. This can not occur unless it skids or slips. Rubber treads are required on the wheels.

Don't forget a tail skid, or wheel. It keeps the stabilizer off the ground and out of the weeds. I now make use of a light solid rubber tire one-inch diameter. On runway landings it minimizes ground looping. Make it sturdy, it takes a beating.

When it comes to fin area, there is a true story that explains it too well. . . . Naturally names and places are changed to protect the innocent.

The scene is a big model meet on the evening before Cargo Day. A well known flier, Gregory, is busily testing a brand new "secret weapon". But he has troubles. It starts out fine, runs four feet, then does the most beautiful pirouettes all over the runway. Again and again. Everything he does turns to circles. He tries a hundred different adjustments but nothing helps. It just will not run straight far enough to gain flying speed. So in despair he hails us down and moans, "What is wrong with this —— —— thing?"

We watch him try it once again. Engine runs fine. Large wheels just ahead of the CG on stiff struts. Long tail moment arm. Smooth runway. No wind. But something isn't right.

"Just a minute," I says. "Gregory, where is your rudder?"

"Oh my gawd! I forgot the bloomin' thing!"

He never even had one made. Well, the moral is, you need seven to ten percent (of wing area) fin on a cargo model to damp out yaw oscillations during take-off.

Testing & contest flying: Testing is easiest on concrete runways with grass close by. It's worth the time to talk with an airport manager and explain the very limited space required for cargo flying, the necessity of your take-off testing facilities. (A small patch of taxi strip on the upwind end of the airport.) Be sure to leave him a PAA Rule Book to thumb through. It is an education for the layman.

Start out with about 25 ounces of cargo. Do plenty of hand gliding. Make sure the gear tracks properly before each flight. Let the motor run wide open with prop on backward. Ten second engine run and hand

(*Continued on page* 40)

launch. About ¼ inch down-aileron is required on the inside (of the circle) wing to prevent spinning in. Apply stab tilt for wide glide circle. All ROG's should be wide open, prop on correctly.

The shorter take-off run seems better, but don't allow a power stall in the flight pattern. An increase in load often cures this. Also lengthens run.

Contest flying requires preparation and clear thinking. Your engine must be tops. It's a good idea to have a spare. You must have reliable systems. The engine timer must be so consistent and familiar that you can pinpoint runs between 19.5 and 19.8 seconds. Every tenth of a second counts. I use a Tatone Tickoff with a special stop arrangement. It is a narrow strap of brass (.020) laid across the timer face and held on by the mounting screws. An "L" shaped upright is soldered to this at a predetermined location in the arc the timer arm traverses. Make a number of these with varied setting. Now when you wind the arm around, it hits the stop and locates at the same place every time. Without even looking.

Key all surfaces. Make engine and gas tank easily accessible. I rubber band the engine and firewall on so that you can quickly replace the whole unit if necessary.

About a week before the '57 Nats I installed an auto rudder on the Pelican. I figured, "This will really make ol' Don Gurnett sweat." He had a new cargo model with more area and less weight. A visit from Don, my secret hidden in a dark corner. So he says, "I shouldn't tell you this, but I have an auto rudder on my cargo. . . ."

"Blast!"

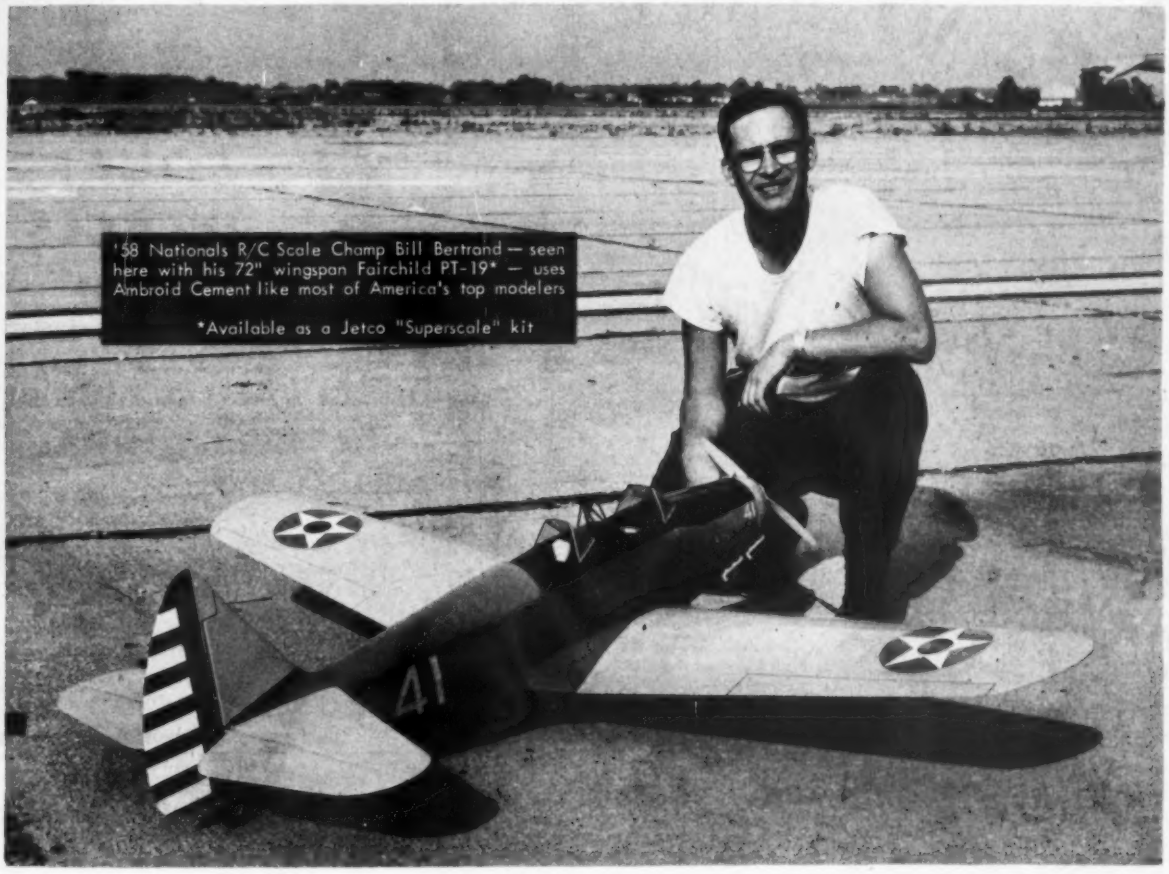
This device operates off the engine timer. A string is attached to the short end of the timer arm via a rubber band. As you wind the timer around, it winds on the string and pulls the auto rudder over to take-off position. As the timer unwinds, the rudder clicks over to the right for climb and glide circle. First four to eight seconds (adjustable) of timer run the model heads straight down the runway. It works!

The three flight cargo rules call for a conservative approach. The safest way (for me anyway) is to choose a weight you can easily lift and that will not endanger the model on landing. Make three flights for credit. Then pile in the cargo and work progressively upward. Watch that you

(*Continued on page 42*)

conrad conrod

R/C SCALE CHAMP USES AMBROID!



"There's nothing like Ambroid for large R/C models" — says Bill Bertrand — "where the strongest possible balsa joints are essential". Like the majority of expert R/C fliers, Bill also goes for Ambroid in a big way because it works just as well on hardwood and even metal joints. We don't ask you to compare Ambroid with brands "B" and "C" — because Brand "A" (that's us!) is simply the best you can buy and there is NO basis for comparison with other brands ..... Of course, Ambroid costs a few pennies more, but that little extra buys the world's finest and best-known cement.

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don't run out of attempts before reaching your top limit. If you have done a lot of testing at home, you have the advantage. You know how high a load you can begin with.

Make the weather work for you. Cargo models profit more by thermal help than any other event. Trouble is you have to fly into one very close to the ground. Not so easy.

CONSTRUCTION NOTES

The Pelican is simple to build. Most important is wood selection. Use lighter wood at the extremities. Hard balsa at center of wing, fuselage front end and cargo compartment. All longerons should be hard straight grained wood. All planking on the fuselage is 3/16 inch sheet. Except for dihedral joints use medium to light C stock for wing ribs.

The wing is shown as a one-piece structure. I found it convenient to have a length of each tip removable to facilitate storage (in a car top). They are taped on and can give if the model overturns on the runway.

If you use tissue, double cover the fuselage and center five inches of the wing. Sig now has light bamboo paper that does very well on large models. Don't be afraid to use dope. It costs two-tenths ounce per coat of butyrate on a 500 square inch wing. One rainy contest can ruin a lightly finished wing.

Fibre glass the front end. I have found it best to leave the cowl whole and just remove the cylinder to get inside. A piece of corduroy cloth cushions the fuselage from the metal saddle on the gear.

A note of caution: Do not head that cargo model toward a car, even if it's 300 feet away. Four times it happened at the last Nats. One guy twice in a row. He (model, too—Ed.) was broken up.

Like Gerry Ritz said at the last King Orange, "This Cargo Flying, it really gets interesting."

Foreign Notes

(*Continued from page 2*)

the minimum weight required for the motor's displacement. It had no less than nine degrees of downthrust on what was essentially a standard, low-pylon, long tail-moment configuration.

In many respects, second place winner Hajek (of Czechoslovakia) had a more interesting model. This followed his usual layout (Hajek is a frequent place winner in East European F/F events) and featured the wing in two halves attached to either side of a fairly high pylon and braced with short struts to the diamond section fuselage. Whereas most of the new rule models took advantage of the weight requirement by having stronger and heavier structures, Hajek's remained very light, with the weight made up by ballast in the pylon—the theorist's approach, aimed at reducing polar moments of inertia for greater stability through quicker recovery.

For power, Hajek used MVVS 2.5/1956 and MVVS 2.5/1958 Diesels—possibly the only engines on the field equaling the power of the Oliver Tigers—and he had a most ingenious timer link-up which also operated a variable incidence stab.

In this, the clockwork type timer was provided with a removable pin on the left side to lock the setting and a spring-loaded plunger, to perform the same function, on the right side. When the fuselage was gripped for launching, this plunger fell conveniently under the forefinger. With the engine running and everything set for launching, the plunger was de-

pressed and the pin removed. Thus, the timer did not start until the precise moment that the model was actually released –giving the owner time to select his precise moment for launching and making for more accurate engine run timing.

The variable incidence stab was arranged to operate a moment or two after the timer had stopped the engine, in order to allow the model to lose flying speed. The linkage was connected to a trigger arrangement on the trailing edge of the stab, which popped up just sufficiently to settle the model into a perfect glide.

Undoubtedly, this system, often advocated but seldom used, and designed to control the power flight and prevent looping, can be made to work very well. Third place winner Bond Baker also used it. His model, powered by an Oliver, was one of the most beautiful ships at Cranfield. Of classic appearance, it had double-elliptic planform wing tips and tail surfaces and a slim, streamlined fuselage of moulded balsa. This latter first involves making a long wooden former, around which soaked balsa panels are wrapped, but seems to be well worth the effort where more than one model is to be built to the same design.

Baker used the same type of monocoque fuselage structure in his Wakefield winner. So many times in the past have we seen ugly, boxy models triumph, that it was particularly pleasing to see a good-looking model win. Plans of Bond's model are to be featured in a future issue of MAN, so we will not detail its features here. Rune Johansson of Sweden, who finished third, also had a very sleek model, with a similar slim balsa body and had the wing carried on a low streamlined mount.

Both events were notable for the wide variety of designs entered. Differences were not merely confined to pylon versus high-thrustline, or folding v. feathering props. Some of the departures from standard were really basic.

In the gas event, for example, Hans Beck of Germany entered a low-wing. It had an all-balsa fuselage with the front end swept sharply upwards and supporting a long, streamlined engine nacelle. The wings were basically V-dihedral, but with the last three or four inches of tip turned up, almost like tip fins. It was powered by a Webra Mach-1 motor driving a folding prop and was quite stable in the air, but seemed to lack climb.

Fritz Reiss of Austria had a high aspect-ratio shoulder wing ship, Mach-1 powered, which featured a sheet-balsa surfaced wing. It placed 29th, including three maximums. Flemming Kristensen of Denmark had a small, profile-fuselage, high-thrustline model with hatchet shaped body and underslung fin. One of the few models not using a motor of the full 2.5 c.c. nominal displacement, it had an Italian Super-Tigre G.31 .09 cu. in. drum-valve Diesel and was scaled down accordingly. Another substandard size model was that of Lothar Piesk of Germany. This had a Taifun Hurrikan .09 reed-valve Diesel enclosed in the front of the pylon, after the style of Carl Goldberg's "Cumulus."

The Wakefield also had its share of unconventional models. Marc Cheurlot of France entered an unusual looking gull-winged job and, in the third round, the wings folded as it left his hands. He then brought out a most astonishing model having a short fuselage carrying a return-geared motor. Below the tail end of the fuselage was attached a large, underslung swept-back fin and fitted below this was a flat-surfaced swept-back stabilizer. At the time we had just been discussing with Frank Zaic how one could get the strangest

experiments to fly well—given enough time for experimenting. A little later Cheurlot was able to prove this by clocking only five seconds short of a maximum.

Ossi Czepa, former winner of the World A/2 glider title, had an unorthodox Wakefield with a balsa tube fuselage in two sections. One section supported the wing and tail assembly and the other, removable for winding, carried the prop and motor. Ossi did not have much luck with it however. Ideas on how best to make use of the new 50 grams of rubber, incidentally, were pretty fluid. In the British team alone, prop/rubber combinations varied from 18x22-in. and 10 strands, to 23x31 and 14 strands.

It is still debatable whether the new FAI rules are a change for better or worse. Although there was no fly-off in either event, there were still plenty of maximums and thermals played, if anything, a bigger part than ever, so the FAI's hoped-for reduction in the luck element and fewer flyaways hasn't materialized. Both types of model go up a bit slower, but, in general, are no more docile when out of trim. The gas jobs, in fact, are certainly more lethal in a spiral dive, at the new weight.

In other words, the FAI must apply some entirely fresh thinking to future proposals to change the rules—or leave them alone.

Indoor Models

(*Continued from page* 25)

motor stick length brings center of wing over center of rubber motor, provides good balance.

Othe key features of good designs are:

Airfoil of wing and tail. Keep it down to ¼" thickness or less. Higher curves make model unstable nose up and down. A lifting tail of shallow curve is generally used.

Hollow stick to hold rubber motor saves weight and provides needed strength.

Hollow tail boom gives rigid support to tail, saves weight, prevents tail flutter which usually comes with thin, single-stick tail booms. This spoils flight adjustments, must be eliminated for good flights.

Nylon thread wing bracing permits lighter construction but still keeps wing from "washing out" or warping in flight.

Paper tubes to hold wing in place allow incidence adjustments and wing removal for packing.

Prop pitch of about 45 degrees to the prop shaft, gives slow revolutions per minute and long duration.

• • •

Patience pays off in indoor construction. Procedures described here have been tried and proved. They were selected with an eye toward ease of success for beginners, clumsy outdoor builders and many-thumbed oldsters.

Weight of each part is a new dimension that enters indoor construction. Plans always include a list of weights because an indoor design simply can't be copied by following outlines; shapes and sizes. Weights also must be duplicated.

So a builder needs a scale. A simple one, easy to make, is a wooden block, mounted in convenient fashion, with a few inches of .015 music wire attached. Parts of known weight are placed on the wire's end hook and a scale of weights marked off on the block. After a number of tests, a full range of indoor weight graduations may be marked.

Curved tips for tails and wingtips are easy. Strip wood of proper sizes. Soak it in hot water five minutes. Then bend slowly around a tin funnel placed over a 100-watt electric light bulb. The heat steams

(*Continued on page* 48)

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the water out of the wood giving it permanent curved shapes. Don't rush it. Take a few minutes to dry the curved section. Curves are more for structural purposes than looks. They reduce the number of angular joints that cause warps.

Hollow tube motor sticks and tail booms sound hard to make. Really they're simple. Proper steps in the procedure are the difference.

They stand more rubber tension from wound-up motors than solid sticks. They're only a fraction as heavy.

Cut motor stick blank from sheet wood. It may be a straight stick or one slightly tapered, made so by slightly tapering the blank, leaving the center wider than the ends.

Soak blank in hot water five minutes. Wrap it around a brass tube or dowel ¼" in diameter. Wrap ½" wide Silkspan strips around the wood. They should be wet first. Put the whole works into a regular kitchen oven for five minutes at 360 degrees. That steams the wood to shape, dries it into a tube.

Tail booms are made the same way. Use a tapered dowel or the tapered handle of an artist's paint brush. Since the curve is sharper, thinner wood is used—usually 1/64" sheet.

• • •

The most common method used to keep wing and stick together is the tissue paper tube system. Tubes about ½" long are made by wrapping light tissue paper—Jap or outdoor rubber model tissue—on a nail of 1/16" diameter or the same size as balsa wing struts. Use clear dope between layers of paper. Six layers will do. Slide off nail while still wet. Allow tubes to dry.

Use a sharp bit rolled between the fingers to drill a hole in the top of the motor stick. Slide the paper tubes in, sight them from the front to be sure they're vertical, then cement in place.

Snug fit by wing struts is necessary so they will hold adjustments. If model stalls, raise rear strut. If it dives, raise the front strut. In extreme cases, chop off bottoms of one or the other strut for more adjustment.

Thrust bearings are easy to make. Cut 1/32" sheet aluminum to size—3/32 wide by ¾" long—then pound the hole for prop shaft through with a steel needle and a hammer. No need to drill it.

Some experts use bearings with double holes. In this case the rear hole needs to be notched—shaped like a key-hole, so the prop shaft may be snapped in and out of position for removal. First punch the hole then file the notch in to it.

Three-piece propellers are the easiest kind for indoor models. Use sheet-wood blades, square stick balsa for hubs. Note that size of hub block determines pitch. Square blocks will give a 45-degree angle. By sanding the hub down to lines of prop, weight can be saved.

Paper covered props are used successfully. Carve the front side or face of one blade. Don't cut the tip on it. But mark out the tip outline. Sand a 3/32" square stick round. Pin it in place on the carved block. Place ribs over it. Fill in the outline with 1/32" square soft wood. Cover front side only with condenser paper.

Right-hand glider throwers can get most endurance from their gliders but using a side-arm launch. Nose-up 30 degrees, wing banked 30 degrees for a right turn. Rudder is trimmed for a left turn. Aileron trim may be used. Result: Glider flies through a complete cycle of right curve in the climb to left curve in the glide down from its peak. It's the best way to get maximum flight, altitude and duration in a limited space.

Microfilm is interesting to work with.

Make a tank from wood and cardboard. Place a plastic table cloth or shower curtain over it and fill with water. You need at least three inches depth and four inches between edge of film hoop and tank sides. Use table spoon to pour film to water's surface. It must be done in a steady stream, no interruptions or dribbles as they will separate from main film.

Water must be 75 to 80 degrees fahrenheit or film will not spread enough. If water is too hot, film will spread too much and become too thin. As film spreads over water's surface, look for its edges and carefully stretch it before it sets.

Wood frames made from ⅛" by ⅜" balsa sticks are fine to lift film from water. Be sure corners of frame are firm and rigid. When film has been in water four or five minutes, place wood frame on top of it. Locate frame so at least two inches of film overhang beyond frame on all sides and corners.

With fingers wet, carefully gather this overhang film over the frame. Don't miss any. Be sure film is wrapped over frame. Then carefully lift one edge of the frame until vertical, and remove from water. It should dry for at least 24 hours before a delicate balsa frame is applied to it.

Saliva or water may be used to stick frames to microfilm. Wings are covered before dihedral is put into them. To remove large wrinkle caused by dihedral angle, wet finger and draw it across wrinkle. The water will tighten film as it dries. Cut film with dope or thinner on a brush, or a heated wire.

Patching microfilm surfaces is fairly easy if directions are followed. Apply film to a sheet of newspaper by wetting edge of paper and placing it on a hoop of film. Cut out as with wing or tail. With scissors trim "mike" covered paper to size about ⅜" larger than hole to be patched. Scissors will seal film temporarily to paper.

Before placing paper-film patch over hole, find an edge in the patch where film is starting to separate from paper. Now, with that edge located, place patch in position, pushing it gently against the film of the wing or tail being repaired. Film on paper will adhere to other. Peel paper away from film and admire neat repair job.

While a microfilm model is very delicate, it may be kept for years if carefully packed in a box fitted with holding apparatus.

The method of sticking model frames to film is to wet the frame with the tongue or with regular tap water applied with the finger tips. Quickly apply the frame to the film on the hoop. There will be skips where it refuses to stick. With a small brush, apply water between wood and film.

* * *

Condenser paper covering is best put on the wing frame by sticking it along leading or trailing edge with thinned dope, then pulling it gently into place and sticking it to the trailing edge. If the wing is three sections, center and two tips, cover each separately but cement the sections together with dihedral before covering. Remember—with paper—dihedral before covering. With microfilm, dihedral after covering.

The trend in wing design is toward the three-panel type—a wide span center-section without dihedral because it can be made stronger without a dihedral break in the center—then two tips each about one third of the center section. Tips are turned up to form the dihedral angle. This type of wing seems to give the best flying results and is easier to keep strong yet light. Cement joints are counted on indoor jobs. They mean weight.

If you're flying in a low-ceiling gym—say 20 to 30 feet high—you can do things to your propeller so the model will stay at

medium altitude for cruising. Cut the leading edge as shown with the center well behind the blades. Sand the blades thin along the shadow lines. Then under full power, blade with flex—or increase its pitch or angle. This reduces climb. However, when power is one-third used, propeller will regain its regular pitch angle and tend to hold more rpm. This holds altitude and keeps plane from coming down, still not climbing rapidly.

Flying indoor models is a compromise between amount of rubber, total weight of plane and propeller pitch. The height of the place where you're flying enters into it too.

Try to fly on the smallest amount of rubber possible. But if it doesn't climb, you must go up in rubber size or add strands. Husky 24-inch span jobs will take a loop of ⅛" flat rubber about 18" long for a 12" stick. Light weight jobs of the same size may fly on 1/16" loop, and in-between weight ships will use a loop of 3/32" rubber.

The length of the loop means something too. A long loop reduces power but increases turns or duration of prop run. Keep this in mind. If your ship isn't climbing, perhaps you have too long a loop. Generally, once and a half the distance between front and rear hooks is average. Some builders go to two or three times this distance. Winds increase with length—so does weight.

If a model climbs rapidly to the ceiling, its prop probably doesn't have enough blade angle and it probably has too thick a rubber motor. Adjust either one and try again. If turns run out in flight, rubber size is too thick. Model should land with some turns left.

This brings up the idea that if your model refuses to climb, maybe your prop pitch or blade angle is too steep. Flatten it out slightly and try the same rubber power. At the same time remember that you can adjust for climb by increasing the incidence by raising the front wing strut in the balsa tube. Another way is to gently steam or warp or breathe on and bend the tail boom to get more negative incidence in the tail.

Circle your plane to the left—with torque. The circle should be 30 to 40 feet in diameter, but even shorter ones will give good results. The rudder may be offset ½" to get this turn although ¼" should give desired results.

Those are the high points. Good luck with your adventures in slow speed aeronautics.

The 1958 World Championships

(*Continued from page* 15)

over, one of the few top men to stick to Torp 15 power) dropped nine seconds to fifth place. Ultimate winner Frigyes was now lying sixth.

By the fourth round, things were beginning to warm up. Wheeley brought Dean's big Oliver-powered model through for yet another max, challenged now only by young Ossi Niemi's fast-climbing Webra Mach-1 powered model. In this round, 2:30 to 4:00 p.m., thermal activity seemed to be most pronounced and no less than 33 maximums were scored—more than twice as many as in the previous round. Frigyes, with another max, had now climbed to third place, ten seconds behind the leaders.

And so to the final round. All attention was now focused on Wheeley and Niemi and they were photographed together as they came out to fly. Niemi got off first,

(*Continued on page* 52)

STATEMENT OF THE OWNERSHIP, MANAGEMENT, AND CIRCULATION REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, AS EMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946.

(Title 39, United States Code, Section 233)

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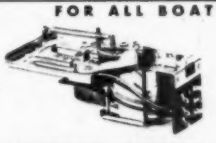

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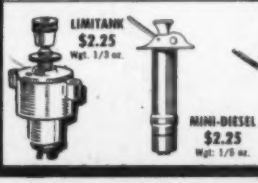

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NEXT MONTH
THE SATELLITE

Bob Hunter's Nats- winning free flight

but his model failed to repeat its spectacular climb of the earlier rounds. Oblivious to a newsreel man's camera recording his doleful expression, Niemi watched it making wide, flat turns to half its normal altitude. It was down again for 1:45.

Now an individual win for the U.S.A. seemed almost in the bag. We had been with Carl Wheeley the previous evening when he had made his very first test-flight with Dean's model. Its climb had been fast and stable; its glide was all that one could wish for: a proxy flier's dream. And it stayed like that through four rounds. Could it lose now?

It could. It started off with all the appearance of following the familiar pattern of its earlier flights, but went past the vertical and lost altitude in the ensuing pull-out. In the remaining few seconds engine run, we watched it correct itself and climb away strongly, but the damage was done: with insufficient height to catch any lift, the model clocked 1:53.

And so we went to watch Erno Frigyes, where team manger Beck was busy waving everyone out of the way for 30 feet around. He needed 171 seconds to be a certain winner.

The right kind of hand-launch can be worth quite a few feet of altitude. All set, the Schlosser running crisply, Frigyes held the model aloft, then, dropping his left hand, he was streaking across the grass to hurl the model into flight like a javelin. Three minutes later a chours of cheers broke from the watching Hungarians, accompanied by much jumping up and down and back-slapping.

Maximums were now coming thick and fast and all the first nine place getters clocked the full three minutes for the last round. Valdimir Hajek of Czechoslovakia, one of the most consistent performers in Europe, moved quietly up into second place, only six seconds behind Frigyes and with a score-sheet almost identical with that which had gained him fourth place in the 1955 Championships. In third place was Australia's Bond Baker. Last round maximums eventually relegated Bill Dean's model to 11th place, just below Canada's Hugh Tuck, who thus became top-scorer from the American continent.

Team positions had undergone considerable revision since the lunchtime scoreboard and the final figures now showed the Hungarians and Czechs first and second, displacing Britain and Italy, with Sweden fifth. The Irish, who had started so well, dropped to 10th place. The U.S.A. finished 8th, only one point below Germany and two points below Finland. The American team did, in fact, finish quite strongly and but for their first round setback, would almost certainly have placed in the first three.

So ended the Power Championships for the Victor Tatin and Franjo Kluz trophies. The next day, Monday, the whine of engines and sickly smell of diesel fumes gave place to the whir of winders and whiff of smoldering d/t fuse, as the Rubber Championships got under way. Being competed for were the Alphonse Penaud Cup (team award) and, of course, the Wakefield Cup, most famous of all model trophies and this year celebrating its 30th anniversary.

The weather was now dull and blustery but, fortunately, the wind was almost directly down the mile-long runway to simplify chasing. The Hungarians immediately set the pace with three maximums and a team score of 540, followed by Finland, 522, Britain 512, America 510, Czechoslovakia 502 and Germany 487, all with two maximums.

The Hungarian team was interesting in so much as it contained people who are not solely Wakefield specialists. Benedek, their No. 1 man, is, of course, one of the world's greatest Wakefield fliers, yet he finds time for diverse other modeling activities and is the holder of the present absolute speed record with a pulse-jet of his own design. Gyula Krizsma is also a speed exponent of note and in last year's World Championships, he alone prevented a 1234 Czech win. Laszlo Azor flies team-racers in Hungary with notable success and their fourth man was Power Champs winner Erno Frigyes.

In the second round the Italians made a tremendous spurt with the only full score and closed the Hungarian lead to nine points. Czechoslovakia moved up into third position with Germany fourth, in place of Finland, Britain and the U.S.A. At this stage there were six contestants with double maxes: Benedek and Krizsma of Hungary, Kennedy of New Zealand (proxy E. A. Barnacle), Licen of Italy, Dvorak of Czechoslovakia and Kekkomen of Finland.

During this round there was some rain and many contestants suffered or struck downdrafts. Herb Kothe and Salvatore Cannizzo who had scored the two U.S. maximums in the opening round, clocked

(*Continued on page* 54)

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The units requires only 4-1/2 volts of battery and idles at 2 mils, which upon receipt of modulated signal of 400 cycles at 100% rises to 35 to 40 mils for really reliable operation.

Temperature checked from 130 down to 20 degrees and operation is reliable throughout this range. The TR 4.5 is not recommended for the beginner or the R/C fan with limited radio experience.

It is available only from Ace Radio by special arrangements with the designers Don Kamm and Red Costlow. Another Ace exclusive designer approved kit. Complete parts package, nothing else to buy except batteries, only **$22.95**

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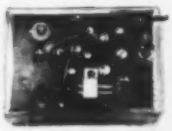

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MarcyTone Transmitter contains two 3A5 tubes - MOPA RF and multivibrator audio; Variable Frequency Oscillator, permits selection of 1700 to 7000 cps; slight modification allows unit to be used with other single channel audio receivers; 100% modulation; aluminited case 3x5-1/2x8 inches; expandable merely by plugging in control box; complete with tubes, 13 mc crystal, resistors, capacitors - everything required except batteries and 3 foot section music wire antenna. . **$18.95**

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6 Channel Control Box, converts transmitter above. **$18.95**

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Ace R/C West
BOX 18 CARMICHAEL CALIF.

only 1:16 and 1:24 and Bill Etherington of Canada had a similar setback. Britain's top all-rounder, John O'Donnell, had his prop fly apart on launching, clocked only eights seconds for the round and went on to finish second from last in the final results—an unheard-of performance.

After lunch interval (and in respect of the lunch boxes we might add that it was here that Cranfield catering did fall short) the team position underwent another reshuffle, Britain moving up into second place, followed by Czechoslovakia, Italy, Yugoslavia and Sweden. Of the morning's six individual leaders, only the two Hungarians, Benedek and Krizsma, kept their scores intact with 540 second totals. The other four all recorded less than two minutes and dropped well down the list.

Now, some of those who had scored just short of maximums in the first two rounds began to move into the picture, among them Perineau of France (533 sec.), Palmer of Great Britain (511), Nienstaedt of Denmark (505), Cizek of Czechoslovakia (502), Scardicchio of Italy (510), Tysklind of Sweden (501), Heidmueller of Germany (500) and Bond Baker of Australia (500).

In the fourth round, neither of the two leaders got a max. Benedek, losing only seven seconds, held on to his lead, but Krizsma took a real tumble and clocked only 35 seconds. This, with only 1:38 by their third man, Azor, lost the Hungarians their team lead and Czechoslovakia moved up into first place, five points ahead, with Britain third and Italy fourth. In this round, Perineau dropped out of the running by returning only 21 seconds and the chances of Palmer, Nienstaedt and Tysklind were all spoiled by low times.

Thus, at the beginning of the final round, it was Benedek in the lead with 713 seconds, then Italy's Scardicchio (681), Germany's Heimueller (680) and Australia's Baker (680). Somewhat farther down were Zurad of Poland (656) and Simerda and Cizek of Czechoslovakia (652 and 650). With nearly thirty seconds' lead, it looked very much as though Benedek would be the winner, but, just as the last round had spelled the downfall of the leaders in the power event, so it was to be in the Wakefield. Benedek's model was down again with 1:40, Scardicchio's after 2:16 and Heidmueller for 1:01. Suddenly Bond Baker was in the limelight: a max now and he was an easy winner.

A bank of cloud came up and obscured the sun. Team manager Alan King looked up and exchanged a word with Bond, then pinched out the d/t fuse. No sense in flying in the wrong kind of air if it could be avoided. A minimum of 2:37 was needed to make sure of first place in case Zurad, who had not yet flown, should get a max.

The cloud was drifting quickly overhead: across the Bedfordshire countryside a line of sunlight was moving towards us. Alan re-lit the fuse: Bond packed on the turns and crouched to fit the noseblock. Seconds later the model was climbing away swiftly and silently to a maximum. For the second time in five years an Australian had won the Wakefield.

Gradually the remaining positions were sorted out. Stanislaw Zurad of Poland (who, five weeks earlier had placed second in the annual M.M.S. Championships competing against Russia, Czechoslovakia, Hungary, East Germany, Red China and Korea) clocked 2:48 to finish 36 seconds behind the winner. Rune Johansson of Sweden was third, Scardicchio fourth, Benedek fifth and Kennedy (N.Z.) reappeared to place sixth.

(*Continued on page 57*)

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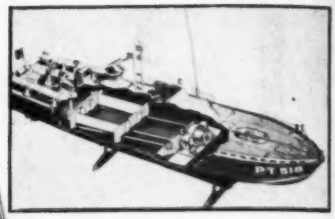

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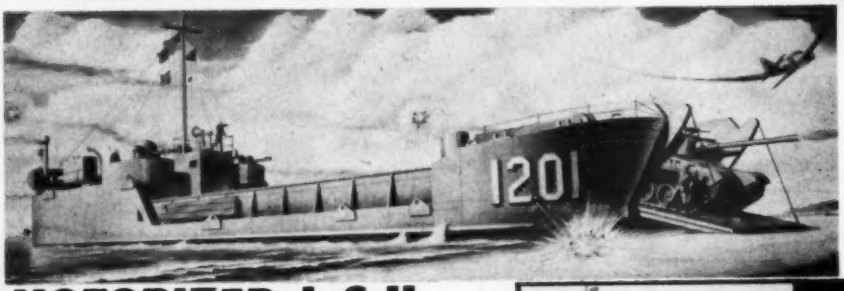

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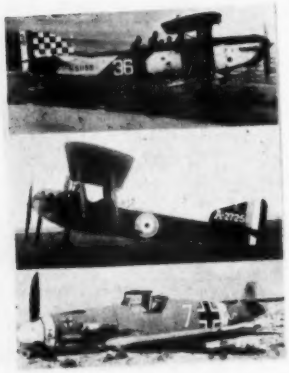

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Text and 248 large photographs illustrate 328 Squadron, Unit and individual aircraft Serial Markings of 1914-1918 War; the "inter-war" period; the 1939-1945 War; and the Korean War. 80 drawings illustrate British 1914-1918 squadron markings. 294 drawings illustrate Insignia of World's Aircraft. 90 coloured illustrations of British Squadron Markings. Many tables of British, French, German, Australian and American Squadron, Unit and individual aircraft serial markings. R.A.F. Unit code letters 1939-1945. British Service Serial Number Allocations 1912-1954. Fighter Squadrons in Battle of Britain and many other Squadron, Unit and individual aircraft serial markings.

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The team positions were once more drastically altered. The Czechs hit a bad patch as Simerda dropped from 6th to 29th and Cizek from 7th to 16th, knocking their team down from first place to 5th. Hungary moved up once more to win the Alphonse Penaud team award, with Italy second, Britain third and Yugoslavia fourth.

There remained the banquet and prize-giving. The Hungarians were given rousing applause for their three wins, but there was no doubt that the biggest cheers were reserved for Bond Baker, the 32-year-old Aussie with the boomerang and the biggest model box at Cranfield (12 cubic feet!) who had come half-way round the world to put up by far the best individual performance of the whole championships.

After the prizegiving and speeches, there was, of course, the usual international get-together, with liquid refreshment to assist in overcoming the language barriers. Soon, some of our East European friends were reluctantly bidding us goodnight as team-managers decided that it was high time all good sportsmen were in bed, but, half-an-hour later, some of them were back again, having, no doubt, seen their managers safely tucked up. Meanwhile, someone had located a piano, which half a dozen stalwarts carried in and upon which Kurt Czepa then performed non-stop until 4:40 a.m. As someone said: World Championships are all too short; you have to make the most of them.

Windmill

(*Continued from page* 23)

Cement 1/16" sheet platform to fuselage, then rubber band tail unit to dowels in fuselage. Check alignment. Add bond paper, cockpit cover and celluloid wind screen. Insert rotor arms in frame of each rotor blade and cement firmly. After cement dries, coat each frame with several coats of fuel-proof dope.

Bend each rotor arm until each blade tip has 2¾" of dihedral. First slip washer on rotor mast, followed by rotor assembly, add washer, ball-bearing washer and washer. Bind tip of rotor mast with fine copper wire and solder. Rotor assembly must turn freely. Screw or bolt motor to plywood. Add 1/32" up thrust to motor. Check alignment and center of gravity position.

Cowling: Cowling may be added for appearance. Cut Sta. #1 and Sta. #2 from ¼" sheet and notch in places shown on plans. Join these two stations with three pieces of ¼" square strips. The length of strips depend on the size of motor to be used. Cover cowling frame with 1/32" sheet balsa. Cut-outs should be made for needle valve, glow-plug, etc. Dope cowling with fuel-proof dope.

Flying: After aligning flying surfaces and checking the center of gravity position, make this very important adjustment before any test flying is done. Tilt the entire rotor assembly to the left (looking from the rear of model) by bending the rotor mast just below the rotor bushing. Bend mast to left approximately 1/32" to 1/16" from original vertical position.

If the giro is powered by a small ⅛ A engine, use full power when test flying. Large ⅛ A engines should be run with a rich needle valve setting or with the propeller mounted backwards.

Select a grassy area for testing. Start engine and begin rotor blades rotating in proper direction (counter clockwise) by turning blades with finger. Never launch the giro by throwing. Walk with model, facing the wind, until rotor blades develop enough lift to fly the model out of your hand. Observe the first flight carefully.

If model turns sharply to left after launching, add opposite rudder tab. If rudder tab does not remedy sharp turn, re-bend the mast slightly to a more vertical position. Never allow model to turn in right hand circles.

The ideal adjustment is for model to fly in left hand circles of approximately 200 feet diameter, climbing slowly to a height of 300 feet with a two minute motor run.

After the engine stops, the giro should descend slowly, with near zero forward speed. If a series of gentle stalls occur upon descent, move center of gravity forward. Spiral dives will not develop in the descent, if the rotor mast is pitched back at the proper angle of 15°.

The model autogiro is not difficult to adjust by keeping the following two adjustments in mind:

1. Power flights—Bending of rotor assembly to the left the proper amount, making finer adjustments with rudder tab.
2. Descent—Shifting center of gravity position until model descends near vertically.

Radio Control News

(*Continued from page* 29)

advises they already use a crystal tolerance of .005.) As stated before, we hope no one will go overboard and insist on using the full 30 watts on 27.255mc. If your receiver won't work on one or two watts, better get a new one.

NEW ITEMS

Photo shows the Model W-1 electric motor from Moen Trading Co., 7 West 24th Street, New York. Measuring 23/32" in diameter and 2-9/16" overall, including the ⅛" shaft which turns in nylon bearings, this model is rated at 6-12v DC. Current drain is exceptionally low, about 50-150ma. At 3000 to 6000 RPM this motor is guaranteed for 3,000 hours continuous running. In an extruded aluminum tubular case, it can be had in sample lots for $2.00 and for less than $1.00 in quantities. We had the opportunity to obtain one of these units about a year and a half ago and found the above statements to be true, the brushes being of a composition material and not flat strip.

• • •

Another photo shows the first in a series of new actuators distributed by Polk's Model-Craft Hobbies, 314 Fifth Avenue, New York. Measuring 1-3/16" x 1⅜" x 2⅜" in its plastic housing, this actuator has high torque when operating on three volts, current drain being slightly over 200ma. Although known as the Compact "A" Compound Actuator, this unit does not operate in a true compound manner. It is similar to the standard escapement. With plenty of power available it should be popular for boat and engine control. Price is $10.95. As this went to press, we received one of the new units in this line. So new it hasn't even been named, this model can provide left and right rudder plus up and down elevator. Each function requires a pulse, with a neutral position between each control. Same power and current drain as previously stated, the price will be in the $12.95 range.

• • •

Photo shows a group of miniature and sub-miniature components, the size of which are compared to a standard GEM relay. About the only item not readily obtainable from RC supply houses is the ultra-small switch made by Grayhill. With the new sub-miniature transistors coming into their own, the ¼, ⅛ and 1/10 watt resistors can be put to good use.

• • •

Consolidated Model Engineering Co., 3087 Third Avenue, Bronx, N.Y., has en-

tered the RC plane field with their 54" Spirit. Designed by Jerry Stoloff, the kit contains excellent wood and other parts and adheres to Jerry's original design and construction. We are impressed with the kit, which sells for $10.95, less radio, engine and wheels, and will advise on flight performance as soon as ours is built. Quick access to radio and batteries and a knock-off gear are some of the features.

• • •

More on one of the first all-plastic Babcock Tri-Pacers, described in an earlier column. The kit is beautifully engineered and all parts fit together like a custom job. Since this is a radical departure from the normal type of building, we have the following comments: Use the contact cement mentioned, available in 25 cent bottles at most hardware stores; we recommend cutting a ½" diameter hole just above the escapement, in the slanting part of the escapement mounting panel (otherwise there is no access to the escapement rubber once the fuselage is together); use some of the scrap plastic to reinforce a mounting section for the switch or jack. Take your time in assembling this model, especially the wing which should be built on a flat surface. Fit all parts together before cementing, just to get the feel of the assembly and don't try to rush things. This is a different type of model and is truly one of the outstanding contributions to RC model building. Will let you know how it flies. The first two test glides were perfect, with no adjustments needed.

• • •

Two photos of the new Citizenship Motor Driven Actuator. The novel feature of this excellent unit is that it may be obtained in kit form or ready built. The kit will enable you to build four different models and the price is $11.95. The built-up models, selling for $14.95, may be readily converted to other models by merely purchasing a set of printed circuit switching discs. Controls suitable for single channel rudder-only to multi-channel use are easily obtained. The popular and reliable Mighty Midget motor provides plenty of power at a low drain. A 10 and a 33 ohm resistor are included to be used as instructed, however, a 20 ohm resistor has been found (on one of our duration models!) to give better results for certain applications. Citizenship's pledge not to produce equipment which will become obsolete is well borne out with this unit.

• • •

The Milo Trading Corp., 215 Fulton Street, New York, offers miniature volume controls of 2500, 5000, 10,000 and half-and one-meg ranges for 49 cents. The same units, except the 2500 ohm size, with a switch which will handle up to two amps at 45 volts, are 59 cents. Both units about ⅞" diameter. Miniature transistor transformers for 69 cents include the CR-60 at 20,000 to 1,000 ohm impedance, CR-70 at 10,000 to 2,000 ohms, CT and CR-80 at 500 to 3.2 ohm impedance, Miniature transistor IF coils measuring ⅜" square by ⅝" high sell for 69 cents and may be useful for experimental work on super-hets.

• • •

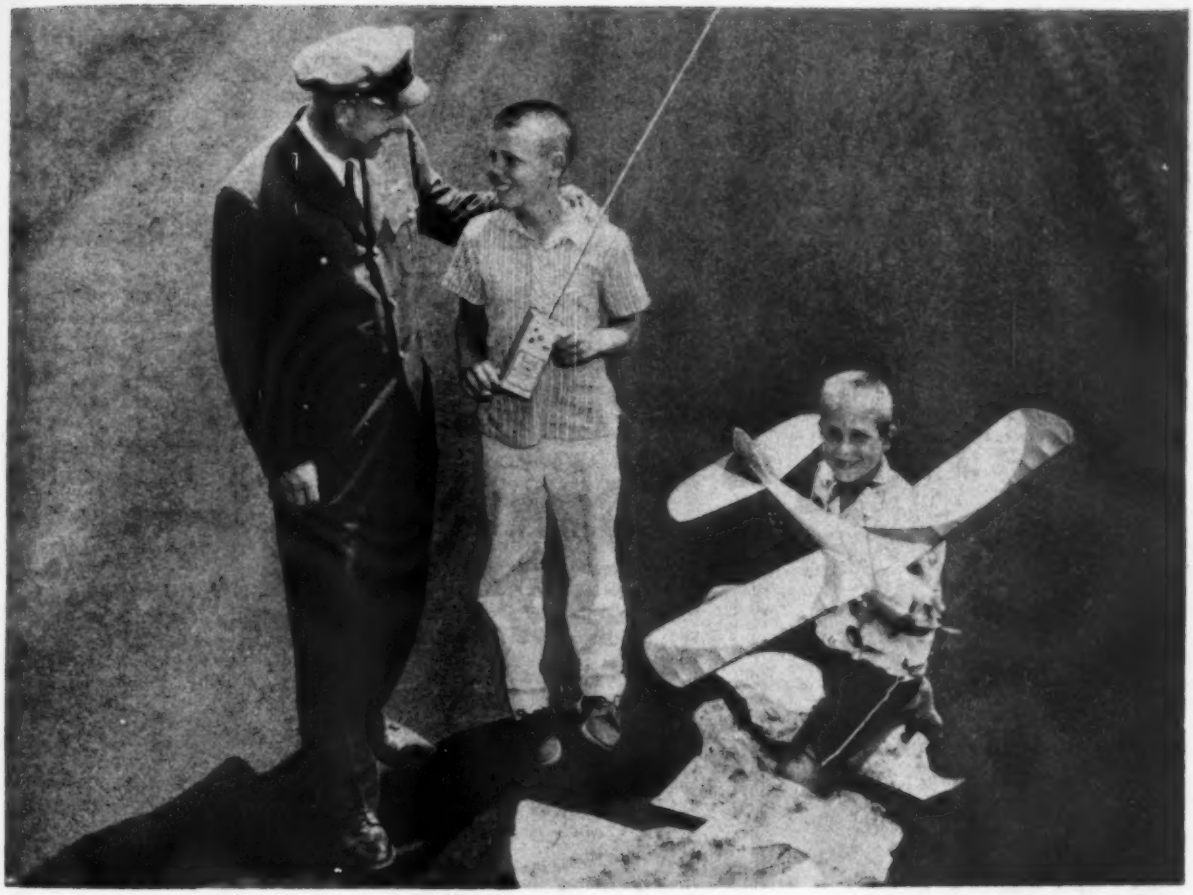
Bill Effinger of Berkeley wrote a letter to Grid Leaks which we feel expressed the feelings of quite a few old timers in the business. In essence, Bill contends that the industry should be less concerned with competition and more in trying to co-operate in getting new customers into RC work. We are in full accord with this, keeping in mind of course that the industry should present quality rather trying to build equipment to "cut throats." There is very little on the market today that is so bad that the public is really fooled. True, some cases have appeared but in the long run they fall by the wayside. It is felt that there is a place for every type of well-designed equipment. One shouldn't expect a cheap receiver to have all of the attributes of a unit costing much more, but this does not detract from the usefulness or reliability of an inexpensive unit.

• • •

Gyro Electronics Company has moved to larger quarters at 36 Walker Street, N.Y.C. Increased business and a widening market made the move necessary. Visitors to Gyro can now browse in their street-level store and the fact that the new location has three times the area of the former location indicates the trend in RC sales. After all, Babcock Models built a complete new building for their activities, complete with flying site and boat testing pond.

• • •

(*Continued on page 61*)



Dick Schumacher, veteran Western Airlines Captain, and family

Sure way to a wonderful Christmas!

Few things bring such happiness in this madcap world as a boy and his pal doing things together. And few things there are that promise both immediate fun and long-time advantages to youngsters like airplane modeling, especially radio-controlled flight.

Here's an easy way for dad, big brother, or uncle to come up with something that gives so much for so long, perhaps even a lifetime! It's the Breezy Jr., designed for radio/control. And the cost is only $6.95 — but it's FREE to you with our R/C package.

There are many thousands of these sure-flying planes in the air. They're ideal as "starters" for beginners. And they go together so fast that you could almost wait until Christmas Eve to start! But don't wait that long! Better get your Breezy Jr. now, and make sure that this is his happiest Christmas yet!

The complete Breezy Jr. kit, including full-size plans and easy-to-follow instructions, is yours FREE with the purchase of the special Radio/Control package shown below.

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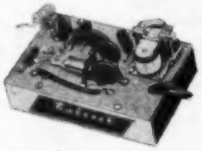
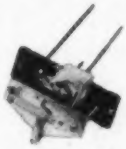
TRANSMITTER, 19.95
Powerful 27.255 mc signal from full-size batteries in a 3-inch square, hand-held case.



RECEIVER, 21.95
Maximum range and reliability. Tiny and light (weighs only 2-ounces).



ESCAPEMENT, 7.95
Elevator and rudder control plus linkage. Rust and corrosion proof.

Breezy Jr., $6.95

or ***FREE***
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For factory assembled transmitter-receiver add $5.00 each.

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The editor's selection of all time favorites, including completely new combinations of the greatest designs. All types!

PLAN SETS 50c p.p.

53. SNAP: Sport U/C, .19-.23.
PELICAN: PAA Cargo, .049.
WINDMILL: FF, 'giro, .02-.049.
For proto take-off and landing realistic Snap tops 'em all. Other two, collector's items.

1. GIMLET: RC Low wing .049.
ROYONO: Contest FF A&B.
So low wings RC are new? Gimlet started it all!

2. COMPER SWIFT: ½A, FF, Scale.
MULVIHILL WINNER: Rubber.
THE LIEUTENANT: UC Stunt, .29-.35.
If it's scale you like, the Swift is a wonder!

3. BUSTER: Rubber, Sport
THIRTEEN: UC Stunt, .29-.35.
VOUGHT SBU-2: UC, Scale, .19-.29.
Buster. Ideal for beginners on way up.

4. SURE FUN: UC Sport, .29-.35
PROFILE SILVAIRE: FF Profile, ½A.
ZEPHYR: Rubber, Fuselage
Control line on floats. Sport Gassie.

6. HIGGINS CABIN CRUISER:
RC Boat, .09-.19.
FOKKER D7: Scale, U/C, .29-.51.
The great all-time favorite? Try the Fokker D-7.

7. WORLD CHAMP GL.: Nordic Winner.
HI BOY: Cabin Stunt, Palmer-Goyet, .29-.35
POW WOW: Bob Palmer stunt, .29-.35
Collector's item—two Palmer models!

8. GEE BEE: Scale U/C, .19-.25.
DRAKE: FF, flying boat, .049.
DURANITA: FF, bipe, .049.
More people built the Drake than any other ship.

10. SMOG HOG: Bonner's Multi RC, .19-.35.
STRATOLINER: 2 Half A, U/C.
GUARDIAN: U/C Scale, .29 up.
Greatest Multi RC of all time—a beauty!

11. GAMBLER: Mirror Stunt Winner, .29-.35.
DOUGLAS B-66: ducted fan FF, .049.
B-66, the ducted fan job that beats all others.

12. WHIRLING WINGS: Sikorsky XH-5, .15, 'copter.
BREEZY: Small field RC, .049.
SPITFIRE: Stunt, semi-scale, .29-.35.
P. Schoenky, 'copter master-his Sikorsky!

13. T-CRAFT: FF scale, .049.
FENO: Combat, stunt, .29-35.
PADDY'S WAGON: Contest FF, .049.
Paddy's Wagon—one contest job ok for beginner.

14. HEATH PARASOL: RC, FF, Scale, .075 .09.
GUARDIAN: Nats carrier winner, .29's.
SHARPIE: FF Sport, .02-.049.
—Guardian a dilly.

15. RE-8: WW1, U/C. .29-.35.
FLAPPING WINGS: Rubber, ornithopter.
BOOMER: FF, sport, pusher, .049.
Can planes fly like birds? Ornithopter sure does.

18. DRAGGIN: U/C Stunt .049.
BLACKBURN: 1912 Scale FF .049.
ASCENDER: Contest FF .049.
Wind in the wires. Goggles. Oh, that Blackburn.

27. PAACKHORSE: PAA Load FF .15.
AIRNOCKER: Scale, FF .049.
What model hit the jackpot? Airknocker—the Champ.

40. FLAMINGO: RC Amphibion, .15-.23.
UPSTART: Best B-C FF, on .29-.35.
NACA planing hull make Flamingo stand-out RC. UPstart—it goes!

42. MUSTANG: U/C Scale, .29.
BI-GONE: Sport, FF, ½A.
GLIDERS FIVE: HL Sheet.
Mustang, Jim McCroskey's Nats winner. Bi-Gone, nifty bipe.

43. TENDERFOOT: 1/2A, FF, beginner
BIG D: FF, delta, .049-.15.
WESTWIND: RC, 1/2A, low wing.
Three stand-outs—good but different!

44. EQUALIZER: .15 to .19 multi, RC.
QUICKIE TRAINER: Speed, .29.
AMAZOOM: FF, contest, .15.
deBolt's best, the Equalizer? Amazoom—Stan Hill's hi-thrust.

45. CONVAIR'S DELTA: Jetex FF.
LIL DYNAMITE: .15 stunt, UC.
SWAT: ½A, FF, contest.
A trio of exceptional planes.

46. ASTRO-HOG: Multi RC, .29-.35
MITCHELL: Profile, .09's, .15's UC.
Dunn's low wing radio—tops! Nothing matches this multi. The Mitchell a fine flier.

47. PROPJET B-47D: U/C, .15's.
RUFFY: Stunt, .29-.35.
NOR'EAST'ER: Nordic glider.
B-47D, beaut of a project Ruffy: big winner—it's new!

48. FOKKER E-3: 1/2A, FF, Scale.
NAVY RACER: Rubber, semi-scale.
WOODY: .29-.35, UC Combat. Hot!
E-3, beautiful model, fine flier.

49. SPORTCOUPE: .09, U/C, Stunt.
WHATIZIT: .35, Combat, Wooten.
SWIF-F-FT: Jetex, two sizes!
Whatizit, settles fuse-wing debate!

50. CONQUISTADOR: .29-.35, U/C Stunt.
TWO-STAGE ROCKET: Jetex (2).
Stunter is a thing of beauty, and it flies as well as it looks!

51. DUMBO: PBY Scale, U/C, .19's.
FRENCH OLDTIMER: 1914, ½A, FF.
Dumbo, the Catalina, man-sized ukie, takes off, lands on water or ground.

52. AMERICANO: .15 FF, by Blanchard.
BOMARC: Scale, Jetex, missile.
CUTLASS: Sport U/C, .049's.
Scorpion power makes Bomarc terrific flier. Americano is National Champ's very latest.

52. GAUCHO: RC Stunt, .29-.35.
THE CHAMP: Best U.S. Wakefield.
LAIRD SOLUTION: U/C Scale, .15-.23.
Gaucho Argentine Champ does pattern inverted. Champ, a single Wakefield!

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List additional plan orders on separate sheet.

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Limited Supply of Plans Listed Below. Order Early! Check Correct Number on Coupon.

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22. Mooney Mite, '55 Rambler, Waco Cabin
23. Humdinger, Old Faithful, Cessna 180
24. Aero Bat, Snoopy, Seagull
26. Corsair, Gyro-Glider, Santanita
29. Cougar, '55 Nordic Winner, Dizzy Boy
30. Great Lakes Trainer, Triple Threat RC
32. Mig-15, Fifinella, Coquette
33. Skyraider, Dunwoody's Nordic, Flexi-Bull-It
34. Corben Super Ace, Cessna 310, Profile Lightning
38. SE-5, Curtiss Robin, Nobody

Several months ago we introduced some pulse equipment manufactured by the Glass City Model Electronics Co., Box 2864 Station B, Toledo, Ohio. Now more about their new Crescent "Go-Around" Proportional Servo. Powered by the Mighty Midget motor, this unit is said to give selective proportional right and left rudder plus selective positionable engine control and is completely fail safe in operation. Pulsed at from 4 to 12 pps, the servo will return to neutral rudder and retard or stop the engine when no signal is present. Price is $8.95 and we'll give more information on the operation as soon as we make the necessary tests.

CLUB NEWS

Took in the New York Mirror Flying Fair and was a bit disappointed. This was mainly due to contestants being allowed but one flight. Flying in general was not up to par, although several fliers put on a post contest exhibition with Smog Hogs, the best one being equipped with Walt Good's system. Too many modelers had gone to the big eastern get together at Indiantown Gap.

• • •

The Flying Bisons of Buffalo claim two events allied to, and to promote, interest in RC modeling. One was the "en masse" viewing by all club members on August 22nd of the Sputnik III rocket. Hal deBolt's lawn furnished the review stand. A few nights earlier, club photographer Jim Schifferle recorded passage of the rocket by camera. Prints are available to all club members. Second, are the demonstrations put on by this club at local drive-in movies. We don't know how much room they have but we do have the local newspaper clipping which announces "thrilling radio controlled midget aircraft, with aerial dog fights and acrobatics." This has been going on since June, starting at about 8 p.m. on Friday and Sunday evenings. Can any other club make these claims? Incidentally, the club members are not strictly RC'ers, there being plenty of free-flight and U-controllers also. We think this really broadens everyone's viewpoint of modeling. Fran Ptaszkiewicz, Corresponding Secretary, 113 Eckhert Street, would probably be glad to furnish information regarding the above demonstrations to other groups.

• • •

Prompted by mention of RC news from eastern Canadian modelers, the Toronto Radio Control Model Club has advised us of their activities. This should help bolster the club membership, since many of the RC'ers in that area are not club members. In existence for sevefal years, this club has over 15 active members and many of them fly five- and eight-channel models, practically all the equipment being home built. Reed units, printed wiring cards, boxes and servos are all built by the club. Some of the "hams" and engineers in the club have been working on a triple proportional system which would present no pulsing problems or fluttering of the controls. Contact Mr. A. G. Roberts, Secretary, 55 Castle Frank Road, Toronto 5, Ontario, Canada.

• • •

Fliers up in our area of Poughkeepsie, N.Y. have tried the Simpl-Simul system and it looks like there will be a good swing in that direction. Kelly Day and Herman Rau have a Cessna 170 and an old old Windy Joe fitted out with the system and no trouble has been encountered in some of the first test flights. Yours truly took the stick on Herm's Windy Joe and managed to bring it out of an otherwise "too close to the ground maneuver." As John Worth mentioned in his articles, this method of control requires slightly higher engine power. Otherwise, Simpl-Simul looks like it will fill the gap between rudder only and big time multi flying.

• • •

Bill Kenyon, RFD #2, Manlius, N.Y. reports on the Syracuse Sky Knights annual Hobo Meet. Gusty weather held the flying down to about 75 flights the first day and rain until the afternoon held flights to 80 the second day. Flying was done after dark on the second day, using a 600-candle power landing light. Club President, Bill Wasser, may have set a new record for a tail spin. Starting at a very high altitude, Bill's ship did 27½ turns before it pulled out about 20 feet off the deck. Anyone beat this? . . . Dick Allen, 2nd in rudder-only at the Nats, predicts that future pylon jobs will be all .19's. Anything less than this just doesn't have it. Dick took second with his Lancer, shown in the October '58 issue and Ralph Jackson took second in Intermediate with a scaled-down version.

• • •

The Peoria RC Tattler brings us the following information. Jim McClintick has a new RC bipe, sporting two Babe-Bee engines, pusher and tractor. Vern Springer's enlarged Rebel will contain home built 10-channel equipment, including servos built by Vern. The team of Overly-Etter has an Esquire, in which they plan to install a proportional system developed by John Overly. The no-wag control surfaces follow the stick movement exactly and the servos draw current only when being moved. This club puts out a plea for manufacturers to put some effort into developing a "converter" in order to allow operation of super-reg receivers on the new frequencies. While not as easy as it sounds, this would be an ideal solution to keeping the tens of thousands of receivers now in use in operation in areas where interference is a problem. . . . The EBRC Carrier of Oakland, Calif., tells of the new receiver system by Bob Leininger which will give channels simultaneous control with a weight of but 2½ ounces. Anyone for ¼A multi?

• • •

For the clarification of some of our Canadian readers, the Vancouver Gas Model Club via their "The Hot Head", advises the following radio equipment has been approved by the D.O.T., Canadian equivalent of the FCC. Teletrol models T-271-B, R-272-A, "Skypilot", T-276 and R-276. Babcock BCT-4 and BCT2 and the CG T12. Canadian restrictions are much more stringent than those in the USA, despite some of the gripes we hear about. Both receiver and transmitter must be type approved, the fee for this being about $70.00. In view of this, it behooves any group of Canadian RC fans to band together on the design and building of equipment and thus share the cost of type approval. One such company, approved by the D.O.T. is: Electronic Laboratories of Canada, LTD., 250 North Grovsenor, Burnaby, New Brunswick. Canadian RC'ers can get complete information from the Department of Transport, 739 West Hastings Street, Vancouver, B.C. Ask for form #2022.

• • •

For those individuals who wish to start a club but feel they don't have the basic ideas as far as a Constitution is concerned, might want to write to the EBRC group for a copy of their latest Constitution. Address of the Editor of the Carrier is 6036 Telegraph Avenue, Oakland, Calif., c/o Glenn Cartet. . . . James G. Maynard, 209 N. 15th Street, Olean, N.Y. announces the formation of the Olean Radio Control Club. Consisting mainly of old time free-flighters, with a few younger enthusiasts beginning to come in, this club is open to all in the Olean area. Their activity and prize lists sound fine so give them a call.

ADVERTISING INDEX—DEC., 1958

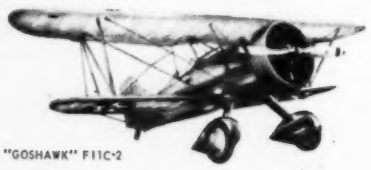
Berkeley's DELUXE SCALE Controliners

In Berkeley Kits you get the "extra": extra detail on the plans and decals; - extra hardware found only in Berkeley kits; - extra precision in engineering and structure; - and above all that, is the extra fly-ability that has made Berkeley World famous.

CURTISS A-12 "SHRIKE"

REPUBLIC "P-47 THUNDERBOLT"

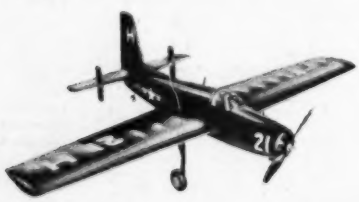
CURTISS SBC-3 "HELLDIVER"



CURTISS "GOSHAWK" F11C-2

GRUMMAN "F-8-F BEARCAT"

NORTH AMERICAN "T-28"



GRUMMAN "GUARDIAN"

NORTH AMERICAN "AT-6 TEXAN"

CURTISS A-12 "SHRIKE" $5.95
For .09 to .19 Engines – 33" Wingspan
Metal Ring Cowl, Rounded Edge Planking

***CURTISS SBC-3 "HELLDIVER"** $5.95
For .09 to .29 Engines – 25-1/2" Wingspan
Metal Ring Cowl, operating flaps, rounded edge planking

CURTISS "GOSHAWK" F11C-2 $4.95
For .074 to .15 Engines – 23-1/4" Wingspan
Metal Ring Cowl, Metal Wing Struts, Plastic Dummy Engine

GRUMMAN "F-8-F BEARCAT" $5.95
For .09 to .19 Engines – 26-1/4" Wingspan
A new kit design throughout. Rounded edge planking

North American "T-28" $6.95
For .23 to .36 Engines – 30" Wingspan
Metal Cowl; Tricycle Gear; Step Keel Alignment

Grumman "GUARDIAN" Semi-Scale $7.95
For .19 to .36 Engines – 53" Wingspan
Metal Cowl; Designed for Stunt and Navy Carrier

North American "AT-6 TEXAN" $4.95
For .19 to .33 Engines – 31" Wingspan
Metal Cowl; Embossed Canopy; Army and Navy Decals

Curtiss HAWK "P-6E" $4.95
For .09 to .15 Engines – 24" Wingspan
Metal Cowl; Metal Wheel Pants; Colorful Decals

"P-40 WARHAWK" Semi-Scale $6.95
For .19 to .35 Engines – 45" Wingspan
Metal Cowl; Stunt Flaps; Flying Tiger Decals

"SHOESTRING" $5.95
For .14 to .36 Engines – 28" Wingspan
Metal Cowls; Spinner; Wheel Pants; Landing Gear

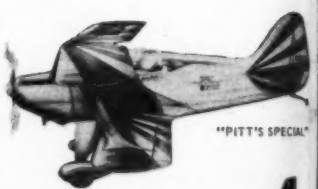
CESSNA "195" $5.95
36" Wingspan—For .19 to .49 Engines
Metal Cowl, "Step-Keel Fuselage" construction

Beech "T-34A MENTOR" $5.95
For .14 to .29 Engines – 33" Wingspan
Air Force Trainer, excellent flyer, easy to build

"MINNOW" Cosmic Wind $5.95
For .09 to .36 Engines – 28" Wingspan
Metal Cowls; Spinner; Wheel Pants; Step-Keel

"PITT'S SPECIAL" $5.95
For .19 to .33 Engines – 25" Wingspan
Metal Cowl; Metal Wheel Pants; Decal Flare Design

*** Republic "P-47 THUNDERBOLT"** $5.95
For .15 to .29 Engines– 32¾" Wingspan
A new design throughout. Rounded edge planking

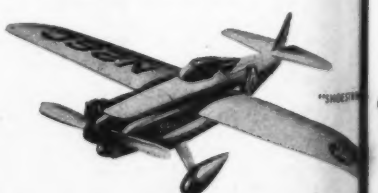


"PITT'S SPECIAL"

"MINNOW"

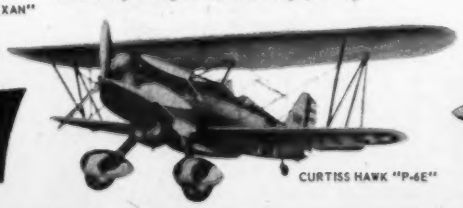
BEECH T-34A "MENTOR"

CESSNA "195"



"SHOESTRING"

(*) These kits feature Berkeley's Rounded-Edge Balsa Planking for easier "solid appearance" construction.



CURTISS HAWK "P-6E"

"P-40 WARHAWK"

Since 1933—Leader in Creative Model Kits

BERKELEY MODELS INC.
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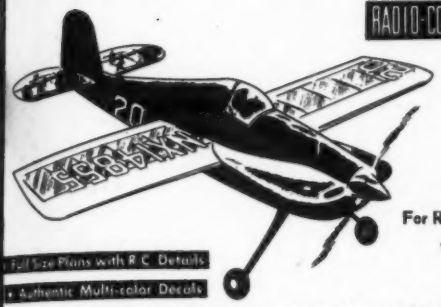
If no local dealer is convenient, mail orders will be filled by Berkeley Model Supplies, Dept. MA., West Hempstead, N.Y. Please include 25¢ packing & postage.

RADIO-CONTROL FREE-FLIGHT CONTROLINE



NEW...

KING SIZE SCALE:

For Radio Control Pylon Racing - Controline Flying

"BUSTER"

• Full Size Plans with R.C. Details
• Authentic Multi-color Decals

For .15 to .35 Engines — 3" Scale — 48" Wingspan **$9.95**

First scale model kit for Radio-Control Pylon Racing, - also for Controline flying. 1/4 size of real 16' wingspan "Buster" racer. Kit No: 3-8

Berkeley's

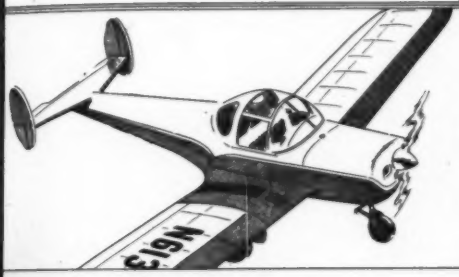
RADIO CONTROLLED FLYING SCALE Designs

CESSNA "170"

$13.95

Radio Control — Free-Flight — PAA-Load
.25 to .35 Engines — 72" Span — 2" Scale

Controlling your "Cessna 170" by Radio is a thrill you will not forget! Perfect in scale, rugged, stable in all attitudes, yet responsive in control, with good wind penetration qualities. The gear location is ideal for extended take-off runs. The larger than average size makes it easier to control in windy weather.



Forney

"AIRCOUPE"

For Radio Control— Free-Flight— Controline

Kit No. 3-7 **1½" Scale** .074 to .29 Engines

$6.95

As much fun as it is to fly-it may be built as a free-flight, radio or controline design. Stable and easily adjusted as a free-flight, rugged and fun to fly. As a radio design-ideal for rudder and motor control, with the data on plans. A truly practical scale design for rough and ready controline flying.

1" = 1' Scale — 48" Wingspan
.035 to .15 Engines

$4.95

De Havilland "BEAVER"

• Formed Metal Ring Cowl

This high aspect-ratio Canadian Bush Flying type aircraft now is in use by the U.S. Air Force. As a scale design, it is well proportioned and capable of contest performance. In R.C. and Controline flying, its long moment arm make it ideal for spot landings with motor control, Metal Cowl, Full Size Plans, etc.

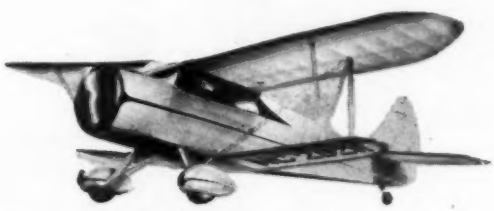
"KING SIZE FLYING SCALE"

"WACO CABIN"

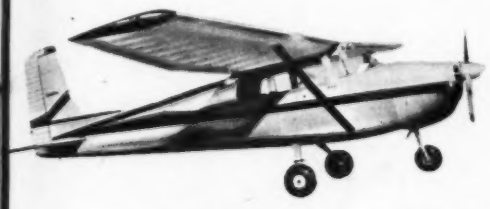
For Radio Control—Free-Flight—Controline

1½" Scale —52" Wingspan

For .14 to .29 Engines Kit No: 3-6 **$9.95**



The 1½" scale "Waco" spans 52". Weight with all radio equipment installed is 4½ lbs. 630 sq. inches wing area. Model is designed for multiple control through compound escapement systems. In flight it is very stable and easily controlled with rudder only type installations. Rudder, elevators, motor and steerable tailwheel may be actuated. Radio equipment is removable as a unit for convenience.



"CESSNA 172"

BIG 1½" SCALE

54" WINGSPAN FOR .09 to .19 ENGINES

• **Adjustable Ailerons** for manually setting trim
• **Laminated Structure** stronger, lighter, easier
$8.95
• **Operating Wing Flaps** radio or controline actuated

Here is the latest scale "Cessna" that is a "natural" for radio control. The big prop slab take-off and lands with "hands-off" control. The model handles just as easy! It's a model builders dream ship!

The kit is very complete in true Berkeley tradition with prefabricated wood parts, silkspun, landing gear and hardware, plus the super-detailed plans and full-colored authentic decals found only in Berkeley Kits.

Army Liaison YL-24

"HELIOPLANE" $3.95

Variable Camber Wing for Two-Speed Radio Control Flying

For .049 to .14 Engines — 39" Wingspan — 1" Scale

"Helioplane" is first model that permits use of scale flaps. Depress 10 degrees for free flight; 25 degrees for slow speed control by radio; or raise 5 degrees for high speed.

"KING SIZE FLYING SCALE"

1½" Scale — 54" Wingspan

AERONCA "C-3"

For Radio Control — Free-Flight — Controline

.099 Engines R.C. — .074 Free-Flight — .15 Engines Controline

Kit No: 3-5 **$5.95**

Designed for rudder control with optional elevator and motor control. Ailerons can be set for trim. All equipment easily accessable through the cabin. Controline version is fun to fly with motor control.

NAVION "Super 260"

2" Scale — 68" Wingspan **For .25 to .40 Engines**

This beautiful scale replica of the famous "Navion" is a fast, rugged and truly different R.C. or Free Flight design, easily adapted to Controline Flying. Thrill to its flashing performance and smooth response. As a free-flight, it will give you experience and confidence in low wing designs. Big, roomy, and well engineered, it will set the pace wherever it's flown. Easy to build!

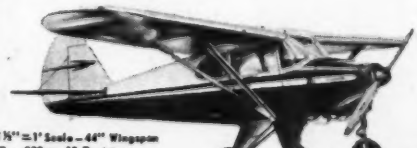
$15.95

Radio Control — Free-Flight — PAA-Load

.15 to .25 Engines—71" Span—2" Scale

"PIPER CUB J-3" $9.95

The "Piper Cub J-3" needs no introduction. Most famous of all light aircraft, it's a natural for R.C. or Free-Flight flying. The six foot span permits the extra R.C. installation that you dream about. This is a rugged, detailed, flight proven design. Full-Size Plan with R.C. installations, Authentic Decals, etc.



1½" = 1' Scale — 44" Wingspan
For .035 to .15 Engines

Piper "TRI-PACER" $5.95

This perfect scale R.C. design may be built as a Free-Flight or Controline version if desired. Full Size Plans cover special details for all three versions. Flaps, elevator, rudder, motor and nose gear may be operated by R.C. Ailerons for trim, cabin door access to Radio, Highly Pre-fabricated, Authentic Decals.

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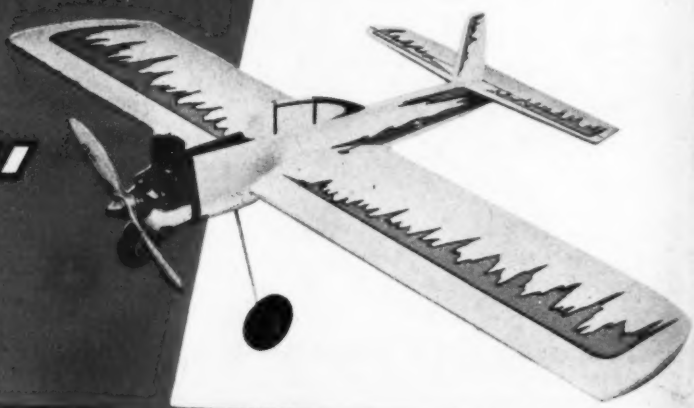
WING JIG
(DAZE and KNIGHT only)
EASY-TO-FLY

AMERICA'S THREE BEST STUNT - COMBAT PROFILE CONTROLINER TRAINERS

All With Hollow Balsa Wings

Berkeley

"KNIGHT"

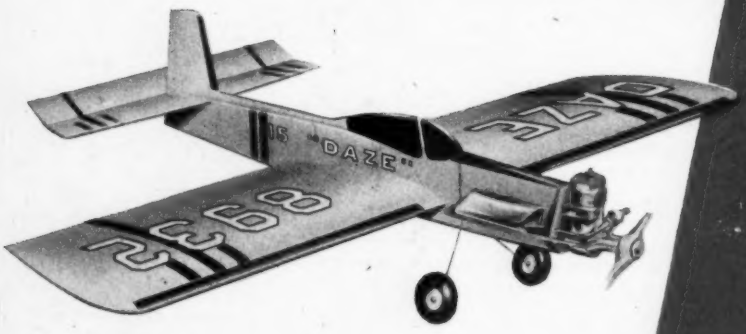


For .19 to .25 Engines

$3.95
KIT NO. [illegible]

KIT FEATURES: All the wood parts accurately prefabricated, hardware and landing gear, plus new "NO-PLAN" for accurate, speedy wing assembly and complete step-by-step photo assembly instructions.

"DAZE"



For .09 to .15 Engines

$2.95
KIT NO. [illegible]

Here's the finest combat model that you have ever seen. New lightweight wing construction featuring "machine-milled" leading edges, no paper covering required. Vertical mounted engine for easy changes. Get more control on corners to eliminate pressure situations. You can use it as a trainer and graduate to fast and aerobatic flying without changing designs!

"JUNIOR PUDDLE JUMPER"

For ½A Engines

$1.95
KIT NO. [illegible]

All Balsa and Prefabricated Wood Parts, Genuine Coverite Hardware, Metal Landing Gear, Rubber Wheels, and [illegible] Parts as only Berkeley Detail Does.

Only BERKELEY Kits feature:
Machine-Milled Wings
No Paper Covering

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Is your motor OLD and TIRED?

It may be just the fuel you are using. Don't throw your motor away until you have tried a can of Fox SUPERFUEL.

Many modelers who have thought their motors were worn out, have saved them with Fox SUPERFUEL. Its extra thick oil film holds compression where others have failed. Result: Many more pleasant hours of flying.

CHAMPION FUEL HALL OF FAME

ROBERT HEMINGWAY
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JOHN WARD
Junior, Control Line Combat

RICHARD BENNETT
Junior-Senior, Radio Control Rudder

JIM VEASEY
Junior, Control Line Flying Scale

GUARANTEE

We will replace any motor which has been damaged by Fox SUPERFUEL. Read the formula on the can. It's one of the best. Each can is guaranteed to be true to formula.

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PINTS, 95¢ AT YOUR DEALER

A MOTOR IS NOT WORN OUT UNTIL IT WON'T RUN ON FOX SUPERFUEL!

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FORT SMITH, ARKANSAS

we get letters...
lots of letters...

Like this one from NEW YORK AERO MODEL PLANE CLUB...

whose President, John Giovine writes: "My Club has tried Power Fuel and find that (1) engines start easier, less flooding, (2) run smoother and cooler, and (3) it gives the engine more life than could be realized. As an example, it took my 1/2A Free Flight plane twice as high in a 10 sec. engine run as with the fuel I had been using!"

Best for Performance... Best for Your Engine!

Thanks, John, for telling us that real modelers like you are finding in Pactra POWER FUEL just the kind of fuel they have long been looking for! Its new lubricant—LUBEX 27—runs cool, Cool, COOL... protecting engines from overheating, seizing, scoring! Its balance formula permits broad range needle valve adjustment. Pactra POWER FUEL makes the transition from 2- to 4-cycling with a *new* smoothness for perfect stunt patterns. Its *complete* combustion leaves engines clean of varnish, sludge and harmful residues... bringing back NEW ENGINE efficiency and power.

PINTS **98¢** HALF PINTS **59¢**

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The **HOT FUEL PROOF** *line that is famous wherever models fly!*

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